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ECONOMIC MULTIPLIERS

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Preface:

This publication presents the most current economic multipliers for the Manitoba economy and examples of their use. All data presented is derived from Statistics Canada's Inter-Provincial Input-Output Tables for 1999. Economic multipliers presented are at the Medium Level as aggregated by the Manitoba Bureau of Statistics (MBS). Traditional Multipliers or Intensity Ratios are presented for 94 Commodities and 51 Industry groups.

Economic multipliers are used to estimate the total impact to the Manitoba economy that may result from a direct change in economic activity (i.e., a direct change in expenditures or industrial output). Manitoba impacts can be estimated in terms of Gross Domestic Product (GDP) at Market Prices, GDP at Basic Prices, Labour Income, Employment and Gross Manitoba Expenditures. New in this publication, both Simple Multipliers (Type I) and Total Multipliers (Type II) are presented, giving users the option of whether or not to include the induced effects of wage respending.

The mechanics of multiplier analysis are relatively simple. However, the inappropriate use or misinterpretation of multipliers can often invalidate results. To avoid common pitfalls of multiplier analysis, the user should be familiar with both the data and the multipliers to be used.

The multipliers presented in this report have been developed to accommodate a broad range of applications. However, there are a number of scenarios where multiplier analysis may be inappropriate or impractical to use. As an alternative, MBS is able to provide detailed economic impact assessments on a cost recovery basis.

Indications that a full economic impact assessment should be undertaken include situations where 1) suitable multipliers are not available 2) data exists in such detail as to make multiplier analysis unwieldy 3) there is a desire to produce the best estimates possible and good quality detailed data is available.

The current MBS Economic Impact Assessment Model contains linkages for the production and use of 727 unique commodities by 300 identified industries. In addition, it contains 170 final demand categories, which describe the average final use of the 727 commodities in the model, such as personal consumption, interprovincial or international trade, investment and government expenditure.

As a result, the MBS Model is far more detailed and versatile than the economic multipliers presented. Initial conditions of the model can be tailored to the type and quality of data available, and to accommodate specific assumptions about the data that would not be possible with multiplier analysis.

In addition, MBS is able to produce estimates of the associated impacts to provincial, federal and local taxes using the MBS Tax Revenue Impact Assessment Model, and is able to provide additional analysis and interpretation of impact assessment results.

Questions and comments regarding the multipliers in this report, or the MBS Impact Assessment Models should be addressed to:

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Table of Contents

SECTION 1: MULTIPLIER DEVELOPMENT

1.1 Input-Output Model Overview 1

1.2 Input-Output Model Limitations 2

1.3 Types of Multipliers 3

1.4 Economic Measures - Definitions 4

1.5 Multiplier Development 5

DIAGRAM: DATA AVAILABILITY & MULTIPLIER SELECTION 6

SECTION 2: MBS ECONOMIC MULTIPLIERS

2.1 Manitoba Commodity Intensity Ratios 7

2.2 Manitoba Industry Intensity Ratios 9

2.3 Manitoba Traditional Industry Multipliers 10

SECTION 3: MULTIPLIER USAGE

3.1 Multiplier Cautions & Limitations 12

3.2 Multiplier Examples 15

SECTION 4: MANITOBA MEDIUM COMMODITY SOURCE TABLE 19

SECTION 5: MULTIPLIER TABLES 25

Simple Multipliers (Direct & Indirect Impacts Only)

Table S1: Manitoba Commodity Intensity Ratios 30

Table S2: Manitoba Industry Intensity Ratios 32

Table S3: Manitoba Traditional Industry Multipliers 33

Total Multipliers (Direct, Indirect & Induced Impacts)

Table T1: Manitoba Commodity Intensity Ratios 34

Table T2: Manitoba Industry Intensity Ratios 36

Table T3: Manitoba Traditional Industry Multipliers 37

APPENDICES:

A: Composition of Medium Level Commodities 39

B: Composition of Medium Level Industries 57

C: Commodity Spending Impact on the Provincial Economy 65

SECTION 1: MULTIPLIER DEVELOPMENT

1.1 Input-Output Model Overview

The Economic Multipliers presented in this report have been generated using the MBS Economic Impact Assessment Model. A general overview of the model offers insight into the theory, proper application and limitations of the multipliers produced.

The MBS Economic Impact Assessment Model is based on Statistics Canada's Input-Output Tables for Manitoba. This set of tables identifies the value of commodities used by Manitoba industries (Inputs) and the value of commodities produced by Manitoba industries (Output). That is, the industry tables identify use and production of commodities. A third table (Final Demand), identifies the end use of commodities, whether purchased for personal consumption, applied to capital stock, or exported outside Manitoba.

The MBS Economic Impact Assessment Model combines the information from these tables to produce a model of the linkages between industries in the Manitoba economy. The resultant model estimates what industries are impacted, and to what degree they are impacted, given a direct change in demand for commodity or direct change in industrial output. (The mathematical derivation of the input-output model can be found in Statistics Canada Catalogue 15-510: *The Input-Output Structure of the Canadian Economy*.)

Within the model, any direct change, such as increased production of buses, or reduced demand for potatoes, has three levels of impact; direct, indirect and induced.

1) **Direct effects** refers to the impact on firms which expand or reduce production in response to a direct change in demand. Changes in output production require corresponding changes to production inputs.
2) **Indirect effects** refers to the ripple effect of directly impacted firms placing increased or decreased demands on their suppliers; also referred to as the industry effect.
3) **Induced effects** are the result of consumer spending in the economy, which is a function of available labour income. Available labour income is scaled up or down with the level of direct and indirect production. The induced effect is also referred to as the "household" or "consumer" effect.

The direct, indirect and induced effects are measured in terms of their impacts to Manitoba Gross Expenditures, Gross Domestic Product, Labour Income and Employment. (See section 1.4 for economic measure definitions)

Total Impacts are expressed in two different ways:

1) **Total Open Impacts** are the sum of direct and indirect effects. It includes direct production impacts plus the indirect impacts of backward linkages to production inputs.
2) **Total Closed Impacts** are the sum of direct, indirect and induced effects. Including the induced effects means capturing one aspect of Final Demand (i.e., household consumption). These impacts are termed "Closed" in that they enclose the household impacts.

1.2 Input-Output Model Limitations

The theories and assumptions underlying the MBS Economic Impact Assessment Model are also embedded in the multipliers generated by the model. Limitations inherent to input-output models of this type, are similarly contained in the multipliers.

The primary limitation of input-output models is their absolute reliance on simple proportionalities. If demand for Commodity X increases 10 percent, all the inputs for the production of X are assumed to increase 10 percent; 10% more raw materials, 10% more labour and overhead costs, 10% more profits.

In other words, it is assumed that base level production is at full capacity, so any incremental output has a one-to-one correspondence with input requirements.

A further observation is that the model poses no limits on production capacity. It assumes all required resources are available, and can be procured from the same sources at the same price (relative to other resources). The model makes no provisions for relative price changes or new efficiencies brought about by improved technology or business practices.

The model provides estimates of the direct, indirect and induced impacts to the Manitoba economy, based on industry averages in 1999. Likewise, the multipliers produce estimates of total Manitoba impacts based on industry averages in 1999.

Therefore, the multipliers are an adequate resource for estimating the average impact to the Manitoba economy that may result from a direct change in commodity demand or industrial production, within limits.

However, more significant projects, or projects not well represented by a particular industry, that also provide an adequate level of expenditures data, may benefit from application of the MBS Economic Impact Assessment Model.

Given sufficient information for a project, MBS is able to apply knowledge of the model to compensate for its apparent simplicity, and accommodate atypical projects to produce more project specific estimates that are less reliant on industry averages.

Notwithstanding, the model cannot provide a complete or absolute measure of the impact of economic change. All resultant impacts should be treated as general estimates only and never as absolutes.

Results derived from either multiplier analysis or the MBS Economic Impact Assessment Model are best when used for comparative purposes. Such practice reduces or eliminates systemic errors that may be produced by input-output models.

1.3 Types of Multipliers

People often speak of multipliers as if they exist in isolation:

What is the multiplier for tourism?

What is the multiplier for housing construction?

These questions need to be better defined before it can be determined whether appropriate multipliers exist. Such as:

What is the employment multiplier for tourism expenditures in Manitoba?

This question specifies a particular economic measure of interest (an outcome), based on a quantifiable input, within a particular economic frame.

In addition to these three requirements (frame, input and output), there are still a number of multipliers that can be proposed:

Simple or Total Multiplier forms of

- Traditional Industry Multipliers
- Industry Intensity Ratios
- Commodity Intensity Ratios

Simple Multipliers (also called Type I, or Open Model Multipliers) differ from Total Multipliers, in that they do not include the Induced (consumer) effects estimated to result from wage re-spending.

Total Multipliers (Type II, or Closed Model Multipliers) include the direct, indirect and induced effects estimated to result from a direct change in commodity demand or industrial production.

Six tables of multipliers are provided.

This report presents Simple Multipliers and Total Multipliers, in the form of Commodity Intensity Ratios, Industry Intensity Ratios and Traditional Industry Multipliers.

Each of the six multiplier tables is used to estimate impacts to Manitoba Gross Expenditures, Gross Domestic Product, Labour Income and Employment. Whether Total Open or Total Closed Impacts are desired is largely dictated by user preference. However, selection of multiplier type (Commodity or Industry Intensity Ratios, or Traditional Industry Multipliers) is largely determined by the type of data available, as indicated by the diagram on Page 6.

Commodity Intensity Ratios are used to estimate total economic impacts based on commodity expenditure information. Industry Intensity Ratios are used to estimate total economic impacts based on a change in industry output. Traditional Industry Multipliers are based on output, but require knowledge of the direct impact to economic measures. MBS Multipliers are fully explained in Section 2 of this report.

1.4 Economic Measures - Definitions

Multipliers can be developed for a number of economic measures. Each of the six multiplier tables in this report can be used to estimate Gross Manitoba Expenditures, GDP at Market Prices, GDP at Basic Prices, Labour Income and Employment (in person-years).

Gross Expenditures represents the gross monetary benefit to the economy. This measure sums expenditures at each of the impact levels (direct, indirect and induced). As a result, it contains a significant measure of double-counting of dollars being spent in the economy, as money flows from direct producers, to suppliers, households and the retail and service sectors. Gross Expenditure estimates are sometimes used because they show a large benefit to cost ratio. But they are only valuable in comparison to other gross expenditure figures.

Gross Domestic Product (GDP) is a measure of the unduplicated value of goods and services produced in the economy. It removes the double-counting of expenditures contained in the Gross Expenditures statistic. GDP represents the net monetary impact to the provincial economy and is the standard measure of economic growth. The MBS Multipliers present GDP at Market Prices and GDP at Basic Prices.

GDP at Market Prices represents the total value of goods and services produced in the economy, including government sector revenue. Calculation of GDP at Market Prices sums all the value generated at each impact level, thus it includes the net value to businesses (operating profits), government (taxes net of subsidies) and households (labour income).

GDP at Basic Prices differs from GDP at Market Prices in its exclusion of direct taxes and subsidies and indirect taxes on products (such as sales taxes). It does, however, include net indirect taxes on production (such as property and business taxes).

Labour Income is an important contributor to economic growth, and is a large component of GDP. Availability of labour income enables consumers to buy products and services to support and expand local industry. Total Labour Income estimated by the multipliers represents the sum of wages and salaries, supplementary labour income and net income of unincorporated businesses.

Employment impacts are an outcome of the Labour Income generated by the production and trade of goods and services. MBS provides employment estimates in terms of person-years; the equivalent of one person working full-time for one year. The Commodity and Industry Intensity Ratios produce Employment impacts in terms of person-years. However, if using Traditional Industry Multipliers the outputs are in the same units as the inputs. This offers flexibility, but also adds to the care that needs to be taken in defining the Direct Employment figure to be used with the Traditional Industry Employment Multipliers.

1.5 Multiplier Development

MBS Economic Multipliers for Manitoba have been developed using the MBS Economic Impact Assessment Model, which is based on the Statistics Canada Input-Output Tables for Manitoba. A wide number of options are available when using the model, thus any number of multipliers could be developed to accommodate different scenarios or conditions.

For instance, the model can accommodate commodity, industry or final demand data as inputs. Commodity inputs can be in purchaser prices or producer prices. If commodity inputs are in purchaser prices, the next options include choice of margin files to use; which estimate the wholesale, retail and transportation margins and taxes embedded in the purchaser price under different assumptions.

MBS has had to apply a number of assumptions to produce the specific sets of multipliers provided. The multipliers that have been produced, follow the most general, and therefore most widely applicable scenarios. This development of multipliers based on "average" case scenarios is consistent with the general nature of input-output models.

Multipliers in this report are presented at a "Medium Level of Aggregation". The composition of medium level commodities and industries, in terms of detailed commodities and industries, are presented in Appendices A and B.

The 94 medium level commodities presented are composed of 727 distinct commodities available in the input-output tables. The 51 medium level industries presented are composed of 300 separate industries.

To develop multipliers at the medium level of aggregation, the value input to each detailed item is determined by the relative importance of that item within the medium level roll-up. In terms of commodities, importance is weighted according to relative use. In terms of industries, importance is weighted by relative value of output.

Implications following from this information include:

1) Detailed items contained in medium designations is transparent, making it reasonably easy to select the appropriate commodity or industry multiplier to use.
2) If project data is well represented by the more heavily weighted items within a medium level item, as will usually be the case, the multipliers should provide a reasonable estimate of economic impacts.
3) If project data concerns less important industries or commodities at the detailed level, multipliers at the medium level may be less representative of the project.
4) The relative importance, or weights, of detailed commodities and industries are not provided due to confidentiality concerns. However individuals with industry knowledge may be able to make these judgements.

Data Determines Type of Multiplier to Use

Available Data	Multiplier Table	Procedure
Dollar value of a Change in Demand for a Commodity in Manitoba.	T1 or S1	Locate appropriate commodity in table. Multiply dollar value of change in demand by the Commodity Intensity Ratios.

Dollar value of a Change in Output of an Industry in Manitoba

Only the dollar value of change in output.	T2 or S2	Locate appropriate industry in table. Multiply dollar value of change in output by the Industry Intensity Ratios.
Detailed cost information, sufficient to calculate Direct GDP, Labour Income and Employment.	T3 or S3	Locate appropriate industry in table. Multiply the known direct impacts (to GDP etc.) by the Traditional Industry Multipliers.

SECTION 2: MBS ECONOMIC MULTIPLIERS

Two sets of multipliers are provided: Simple Multipliers that do not include the induced impacts, and **Total Multipliers** which do include the induced (or household) impacts. Within each of these two sets, three tables of multipliers are provided:

1) **Commodity Intensity Ratios** estimate total Manitoba impacts based on the value of a commodity purchased in Manitoba.
2) **Industry Intensity Ratios** estimate total Manitoba impacts based on the value of output from Manitoba industry.
3) **Traditional Industry Multipliers** estimate total Manitoba impacts based on the "known" direct impact on the different economic measures (GDP, Employment, etc.).

Use of Simple or Total Multipliers is largely a matter of user preference. MBS tends to include the induced impacts, and consistency of approach is one consideration in choosing between Simple and Total Multipliers.

In the MBS view, the induced impacts are quite defensible. The logic used is consistent with the other impacts derived from the MBS Model. However, Total Multipliers do have a bias favouring projects with a large labour income component. If comparing projects with dissimilar labour income levels, using Simple Multipliers will avoid introducing this bias.

Selection of multiplier type, whether Commodity Intensity Ratios, Industry Intensity Ratios or Traditional Industry Multipliers, is largely determined by the type of data available, as indicated by the diagram on the facing page.

2.1 Manitoba Commodity Intensity Ratios

Tables S1 (Page 30) and T1 (Page 34) present Manitoba Commodity Intensity Ratios for 94 medium level commodities, plus Direct Wages & Salaries.

Commodity Intensity Ratios represent the ratio of Total Impact to Direct Commodity Expenditure. Therefore, to use these multipliers, available information must consist of expenditures on identifiable commodities.

Economic impacts are presented in terms of GDP at Market Prices, GDP at Basic Prices, Labour Income, Employment and Gross Expenditures in Manitoba.

Estimation of the total economic impacts of a project, through the use of Commodity Intensity Ratios, is as follows:

1) Distribute the direct Manitoba based expenditures to the appropriate medium level commodities provided in the table. It may be helpful to consult Appendix A to identify appropriate commodities.

2) The total impact to GDP at Market Prices is estimated by multiplying the Manitoba purchase value of each commodity by the GDP at Market Prices multipliers, and summing the results for all commodities.

3) Total impact to GDP at Basic Prices, Labour Income and Gross Expenditures are all estimated in the same manner, using the multipliers in the appropriately labelled column.

4) For the above economic measures, multiplier results will be in the same monetary units as the input data. If using dollars, results will be in dollars. If using millions of dollars, results will be in millions of dollars.

5) Employment impact multipliers estimate total person-years of employment per $1.0 million purchase of each commodity. Employment multipliers (or their results) will have to be adjusted if using different monetary units. For instance, the decimal point will have to be moved three spaces to the left if using expenditures in thousands of dollars. (smaller expenditure; smaller employment impact).

6) As with the other economic measures, total employment resulting from all expenditures is the sum of the person-years estimated to result from each of the commodities used.

Direct Wages & Salaries is a special category.

The commodity intensity ratios for Direct Wages & Salaries (the Direct Labour Income requirement for a project) are used the same as for the preceding 94 commodities in Tables S1 and T1, except for the Employment Intensity Ratio.

The Employment multiplier for Direct Wages & Salaries represents the induced employment (in person-years) per $1.0 million of Direct Wages & Salaries. Total Employment, therefore, requires adding Direct Person-Years of Employment to the multiplier result.

(Note: Direct Wages & Salaries results in direct and induced impacts only; no indirect impacts.)

Commodity Intensity Ratios are quite usable for projects large and small where expenditures can be allocated to commodities. The primary difference in using these multipliers and using the MBS Economic Impact Assessment Model is that the MBS Model requires finer specification of commodities into 727 categories, so not as many individually definable commodities are averaged together. Also, with the MBS Model various options and adjustments can be used to reflect unique project assumptions.

The most important concern in using Commodity Intensity Ratios is knowing what the direct expenditures represent. Any expenditures that are made outside Manitoba are disqualified. The multipliers are to be used only with Manitoba based commodity expenditures.

Direct expenditures made outside Manitoba are termed a **Direct Leakage** from the economy. Expenditures made outside Manitoba have no further economic spin-offs within Manitoba.

Products and services that originate from outside Manitoba, but are purchased directly from Manitoba suppliers are to be included in the multiplier analysis. Multipliers for these commodities will be lower than for commodities produced in Manitoba, as they primarily reflect the marginal costs associated with the product (i.e., the wholesale, retail, transportation and service margins and sales taxes included in the purchase price).

The value associated with the product itself flows to the non-Manitoba producers, and is termed an **Indirect Leakage** from the economy.

Further discussion of how Direct Manitoba Commodity Expenditures are allocated to Indirect Leakage, Direct Manitoba Supply Content, Product Value and Marginal Value, is provided in Section 4: Manitoba Medium Commodity Source Table.

This information can be used to assess how well multipliers fit user expectations in terms of where an important commodity is likely to originate; Manitoba or not-Manitoba. This information can add confidence to multiplier usage, provide an understanding of whether multiplier results are over- or under-stated, or even result in a decision that multiplier analysis is not appropriate for a given project.

2.2 Manitoba Industry Intensity Ratios

Tables S2 (Page 32) and T2 (Page 36) present the Manitoba Industry Intensity Ratios for 51 medium level industries.

Industry Intensity Ratios represent the ratio of Total Impact to Direct Industry Output. To use these multipliers, required information consists of a given change in output from a particular industry.

Economic impacts are presented in terms of GDP at Market Prices, GDP at Basic Prices, Labour Income, Employment and Gross Expenditures in Manitoba.

Estimation of the total economic impacts of a project, through the use of Industry Intensity Ratios, is as follows:

1) Identify the appropriate medium level industry in the table. It may be helpful to consult Appendix B to identify which medium level industry to use.
2) The total impact to GDP at Market Prices is estimated by multiplying the change in output by the GDP at Market Prices multiplier.

3) Total impact to GDP at Basic Prices, Labour Income and Gross Expenditures are all estimated in the same manner, using the multipliers in the appropriately labelled column.

4) For the above economic measures, multiplier results will be in the same monetary units as the input data. If using dollars, results will be in dollars. If using millions of dollars, results will be in millions of dollars.

5) Employment impact multipliers estimate total person-years of employment per $1.0 million output from each industry. Employment multipliers (or their results) will have to be adjusted if using different monetary units. For instance, the decimal point will have to be moved three spaces to the left if using data in thousands of dollars.

If more than one industry is being examined, total impacts to economic measures are derived by summing the multiplier results from the different industries. However, when assessing the impacts of more than one industry, caution must be used to avoid potential double-counting of impacts.

For instance, if studying the impacts of expanded sawmill operations leads to the realization that logging operations will also be impacted. That is correct. The impact on Manitoba logging operations is included as an indirect impact of increased sawmill production. If the expected impact on logging was analyzed separately and added to the sawmill operation impacts, logging impacts would be "double-counted".

In practice, Industry Intensity Ratios are most valuable in developing order-of magnitude estimates based on a change in production for a single industry. The industry intensity ratios have the least specific data requirements, which in turn provide the least specific impact estimates.

They do not take into account the specific spending pattern for a given enterprise, as the Commodity Intensity Ratios do. Nor do they use any direct information about the project (as is required by Traditional Industry Multipliers), other than the gross change in output.

2.3 Manitoba Traditional Industry Multipliers

Tables S3 (Page 33) and T3 (Page 37) present the Manitoba Traditional Industry Multipliers for 51 medium level industries.

Traditional Industry Multipliers represent the ratio of Total Impact to Direct Impact for each economic measure within the context of each industry. Use of these multipliers requires as foreknowledge (i.e., the ability to calculate) the direct impact to GDP, Labour Income, Employment and Gross Expenditures in Manitoba.

Estimation of the total economic impacts of a project, through the use of Traditional Industry Intensity Multipliers is as follows:

1) Use project information to estimate the direct impacts to GDP, Labour Income, Employment and Gross Production
2) Identify the appropriate medium level industry in the table. It may be helpful to consult Appendix B to identify which medium level industry to use.
3) The total impact to GDP at Market Prices is estimated by multiplying the direct impact to GDP at Market Prices by the GDP at Market Prices multiplier for the indicated industry.
4) Total impact to GDP at Basic Prices, Labour Income, Employment and Gross Expenditures are all estimated in the same manner, using the known direct impacts to these measures with the multipliers in the appropriately labelled columns.
5) Traditional Industry Multiplier results will be in the same units as the input data. If using dollars, results will be in dollars. If using millions of dollars, results will be in millions of dollars.
6) This is also true of the employment multiplier results. If direct employment is estimated in terms of person-years, the total employment will be in person-years. If direct employment is defined some other way, total employment will be defined the same way, not as person-years.

If more than one industry is being examined, total impacts to economic measures are derived by summing the multiplier results from the different industries. However, when assessing the impacts of more than one industry, caution must be used to avoid potential double-counting of impacts. This can be especially problematic with vertically integrated industries.

Traditional Industry Multipliers have the most stringent data requirements; direct knowledge of expenditures, including labour costs, profits, taxes, and direct employment. Given good data, the Traditional Industry Multipliers are capable of producing better estimates.

Traditional Industry Multipliers are not required to estimate the direct impacts of the project. They are only required to estimate the spin-off impacts. The direct impact information is supplied by the user, rather than estimated by industry averages contained in the multiplier, as occurs with Industry Intensity Ratios.

SECTION 3: MULTIPLIER USAGE

This section on multiplier usage presents cautions and limitations of multiplier analysis, examples of multiplier usage and interpretation of multiplier results.

Section 3.1 presents two types of cautions and limitations:

1) Multiplier Limitations that extend from Input-Output Model Limitations described in Section 1.2
2) Cautions specific to multipliers regardless of their method of development
3) Implications for interpretation of results

Section 3.2 presents Multiplier Examples to demonstrate:

1) How data availability determines which type of multiplier to use
2) How multiplier results are to be interpreted
3) When multiplier analysis would not be appropriate

3.1 Multiplier Cautions & Limitations

Due to their relative simplicity and power, economic multipliers are increasingly being incorporated into the decision making process. As a result, people unfamiliar with their use may undertake analysis of projects using multipliers. A basic understanding of multipliers, their limitations, and potential misapplication is required to ensure that multiplier analysis is appropriate and results properly interpreted.

To simply find and use a multiplier is not enough. Often, economic multipliers are reported in one document, then borrowed for countless other studies, with each successive reference adding credibility to a questionable multiplier. A familiar example is the often reported 7:1 ratio, which has been used to express phenomena as diverse as the gross expenditures multiplier for a particular sporting event and how often one-dollar is re-spent within a particular community.

When reading an economic impact study, anytime an economic multiplier has been used, the source of that multiplier should be referenced and the logic behind using that multiplier should be provided. Then users of the information can make an informed decision about the suitability of that multiplier to the current study, and its extensibility to other similar studies. Simply stating the multiplier is 7 doesn't provide much confidence.

To achieve meaningful results through multiplier analysis requires that users understand the limitations of their data and the applicability of available multipliers.

As already stated, the type of data available, is the best determinant of which set of multipliers to use from this report.

Using commodity expenditures with industry intensity ratios, or using industry output with the traditional industry multipliers provides a multiplier result, that looks like any other result. However, it will be completely meaningless. Therefore, using the wrong multiplier is a real concern.

Using the wrong multiplier can occur in numerous other ways. This report is only one source of economic multipliers. One of the strengths of these multipliers is that they come with documentation describing their development, assumptions, usage and limitations.

In practice multipliers are found, developed and continually reused with little documentation or appreciation for the particular circumstance for which they were developed. For multiplier results to be meaningful, the multiplier has to represent a situation typical to the project being assessed. Without knowledge of the multiplier, this fundamental requirement cannot be ensured.

Given that a meaningful multiplier must represent a situation typical to the project being assessed, inappropriate multipliers include:

1) Multipliers developed for an economic region other than the economic region of interest.
   A Canada level multiplier is appropriate for Manitoba expenditures if the impact to Canada as a whole is of interest. Otherwise multipliers based on the Canadian economy, or another province or country cannot adequately provide impact estimates for the Manitoba economy.

2) Multipliers developed from a previous study may appear representative in terms of activities or industrial sector, but be quite unrepresentative in certain fundamental ways, such as order of magnitude, Manitoba content, labour content, etc.

3) Multipliers derived from old studies or older models of the economy. The economy is ever-evolving, with different processes changing at different rates. It is difficult to identify at what point a multiplier is too old. However, more current multipliers are a better model for today's economy.

Inappropriate use of multipliers goes beyond selection of appropriate multipliers. Multipliers presented in this report are all used in roughly the same way, albeit with different types of data. However, multipliers from other sources are sometimes derived differently, presented differently and applied differently. Familiarity with other types of multipliers can lead to confusion and misapplication of the MBS multipliers as follows:

1) Other published multipliers may require different input data.

2) They may require intermediate inputs to actually create the final multiplier to use.

3) They may not include the direct impacts, requiring these to be added to the multiplier result.

4) They may not include the induced household effect.

5) Their origin may be unclear or unknown.

Once all these concerns about multiplier suitability and proper application are satisfied, concerns about multiplier limitation and interpretation remain.

Multiplier limitations relate directly to the assumptions used in their development. Therefore, the MBS Multipliers have the same types of limitations as economic input-output models (described in Section 1.2). The primary limitation is their absolute reliance on simple proportionalities.

For instance, the Industry Intensity Ratios for Construction (Industry 8) indicate that for every $1.0 million in output, 16.1 person-years of employment are estimated to result.

How well does this relation hold for $150,000 house construction, as compared to $10 million building construction, $100 million arena construction and $600 million floodway construction?

What is an average construction project?

The multipliers can clearly only provide a rough estimate of the impacts.

It should also be recognized that multiplier results represent gross impacts to the Manitoba economy. The multipliers are not able to compensate for other economically driven choices that may result from the project or activity under study, such as substitution effects.

For example, operating a new hotel may take business away from existing hotels rather than create all new demand for such services.

To derive net economic impacts, a big-picture view has to be applied to data development and project definition. Ultimately, it is the quality of data, and the framing of the project that will determine how well multiplier analysis describes the impacts of a project. Interpretation of multiplier results cannot be separated from project definition, data development and assumptions contained in the data.

Despite the above cautions and limitations, the multipliers provided have been developed to have the broadest application possible. However, users have to determine to what degree a multiplier suits their purposes, and the degree of confidence to place on multiplier results.

3.2 Multiplier Examples

Section 2: MBS Economic Multipliers, presented an overview of the multipliers provided in this report, with descriptions of how each type of multiplier is used, what type of data is required and how results are to be interpreted.

Following are some illustrative examples using each type of multiplier; commodity intensity ratios, industry intensity ratios and traditional industry multipliers. Examples presented use the Total Multipliers in Tables T1, T2 & T3 (Pages 34-37). Application of Simple Multipliers would be identical and are left as an exercise for the reader.

Industry Intensity Ratio Example:

What are the economic impacts to Manitoba of a $10.0 million increase in poultry processing?

Given a change in output from a Manitoba industry, the choice of multiplier is limited to the Industry Intensity Ratios in Tables T2 or S2. We have opted to use the Total Multipliers in Table T2 (Page 36).

The appropriate industry from the table is Industry 9 "Food & Beverage Manufacturing".

Multiplier results estimate the average impact to Manitoba, of a $10.0 million increase in poultry processing, as follows:

GDP at Market Prices:	**$10.0 million x 0.647 = $6.5 million**
Labour Income:	**$10.0 million x 0.328 = $3.3 million**
Employment:	**$10.0 million x 9.97 = 100 person-years**

Increasing Manitoba poultry production by $10.0 million, is estimated to result in a $6.5 million increase to Manitoba GDP at Market Prices, a $3.3 million increase to Manitoba Labour Income and 100 full-time-equivalent jobs in Manitoba.

These impacts would be expected to continue as long as the new production level is sustained. Note however, that these are gross estimates. They do not take into account if another poultry processor may be forced to scale-back operations or close altogether. Note also, that while these estimates do include the impact on supplier operations, they do not include any capital expansion that may be required at the supplier level.

Commodity Intensity Ratio Example:

The poultry processing plant will require a $16.0 million expansion in order to increase annual production by $10.0 million. What are the Manitoba economic impacts that may result from this capital project?

The $16.0 million capital budget is used to identify major commodity expenditures, that will be used with the Commodity Intensity Ratios in Table T1. All expenditures are assumed to be Manitoba based:

$5.0 million for Building Construction (Commodity 65)
$10.0 million for Other Industrial Machinery (Commodity 48)
$1.0 million for Installation Labour (Direct Wages & Salaries)

The average wage for installation labour (full-time-equivalent or person-year basis), is assumed to be $50,000, including benefits. Therefore, Direct Employment is estimated at 20 person-years (which will be used in the Total Employment estimate)

Applying the multipliers from Table T1 (Pages 34 & 35), total Manitoba economic impact estimates are calculated as follows:

Manitoba GDP at Market Prices:

$5.0 million x 0.822 = $4.11 million (Commodity 65)
$10.0 million x 0.155 = $1.55 million (Commodity 48)
$1.0 million x 1.485 = $1.485 million (Direct Wages & Salaries)

16.0 Million Expenditure → $7.1 million Manitoba GDP impact

Manitoba Labour Income:

$5.0 million x 0.582 = $2.91 million (Commodity 65)
$10.0 million x 0.072 = $0.72 million (Commodity 48)
$1.0 million x 1.281 = $1.281 million (Direct Wages & Salaries)

16.0 Million Expenditure → $4.9 million Manitoba Labour Income impact

Manitoba Employment:

$5.0 million x 16.100 = 80.5 person-years (Commodity 65)
$10.0 million x 2.080 = 20.8 person-years (Commodity 48)
$1.0 million x 8.830 = 8.83 person-years (Direct Wages & Salaries)
+ 20 person-years (Direct Employment)

16.0 Million Expenditure → 130 person-years Employment impact

In contrast to the Operating Impacts (in the first example), which contribute to the Manitoba economy on an on-going basis, the above impacts (GDP of $7.1 million, Labour Income of $4.9 million and Employment of 130 person-years) are one-time only. Due to this fundamental difference, Capital and Operating impacts for a project should be identified and interpreted separately.

Traditional Industry Multiplier Example:

Refined operating expenditures data for the expanded poultry processor in the first example makes it possible to use the Traditional Industry Multipliers to provide better estimates of the annual economic impacts of the expanded operation.

Poultry processing would fall under Industry 9 "Food & Beverage Manufacturing" in Table T3 (Page 37). However, first the Direct Impacts to Manitoba GDP, Labour Income and Employment have to be estimated from the projected operating budget.

The $10.0 million increase in production output is summarized as follows:

Poultry	$5.5 Million
Packaging	$0.4
Utilities	$0.4
Other Overhead	$0.3
Labour Income	$1.6
Indirect Taxes on Products	$0.2
Indirect Taxes on Production	$0.2
Interest Payments	$0.4
Operating Surplus	$1.0
TOTAL OUTPUT	$10.0 Million

The average annual wage for direct employment is $35,000. Given Direct Labour Income of $1.6 million; **Direct Employment in person-years is 45.7.**

Total Employment → 45.7 x (3.002) = 137.2 person-years
(3.002 being the Employment Multiplier for Industry 9)
The estimated 137 full-time-equivalent jobs in Manitoba consists of the 46 Direct Poultry Processing Jobs and 91 Indirect and Induced Jobs.

Direct Labour Income of $1.6 million is used with the Labour Income Multiplier for Industry 9; 2.748.
Total Labour Income → 1.6 x (2.478) = 3.96 million.

Direct Gross Expenditures to use with the Traditional Industry Multipliers is simply the $10.0 million Total Output minus any non-Manitoba Production Inputs. Assuming $1.0 million in non-Manitoba production expenditures, Direct Manitoba Expenditures are $9.0 million.

Gross Manitoba Expenditures → $9.0 x (1.968) = $17.71 million.
For every dollar of production spent in Manitoba, an addition 97 cents in spin-off expenditures is estimated.

Estimation of Total GDP impacts requires calculation of the Direct impacts to Manitoba GDP at Market Prices, or Basic Prices, from the company's data.

GDP is often referred to as "Value Added". This understanding can offer an approach to estimating Direct GDP impacts. Contribution to Manitoba GDP at Market Prices is equal to Output Value minus Value of Commodity Inputs.

Direct GDP at Market Prices → $10.0 - $6.6 = $3.4 million
($6.6 million being the sum of raw materials and other goods and services consumed in operating the expansion).

Alternatively, Direct GDP at Market Prices can be estimated by summing the income generated by production; Labour Income, Taxes, Interest, Depreciation, Profits (making sure to not double-count any of this income, as profit reporting may or may not include some of the preceding items)

Direct GDP at Market Prices → $1.6 + $0.2 + $0.2 + $0.4 + $1.0 = $3.4 million

Total GDP at Market Prices → $3.4 x (2.662) = $9.05 million

The difference between GDP at Market Prices and Basic Prices, is the inclusion of Indirect Taxes on Products.

In this example, Indirect Taxes on Products and Production are identified separately, so Direct GDP at Basic Prices can be calculated by subtracting the Indirect Taxes on Products from Direct GDP at Market Prices. (Note, in all cases, these Indirect Taxes are net of subsidies.)

Direct GDP at Basic Prices → $3.4 - $0.2 = $3.2 million

Total GDP at Basic Prices → $3.2 x (2.627) = $8.41 million

Summarized Impacts of the $10 million increase in Manitoba Poultry Processing:

MANITOBA IMPACTS ($Millions)	Direct Impact	Traditional Industry Multiplier	Total Impact Estimate
Direct Change in Output	$10.0		
Gross Manitoba Expenditures	$9.0	1.968	$17.7
GDP at Market Prices	$3.4	2.662	$9.1
GDP at Basic Prices	$3.2	2.627	$8.4
Labour Income	$1.6	2.478	$4.0
Employment (person-years)	45.7	3.002	137.2

SECTION 4: MANITOBA MEDIUM COMMODITY SUPPLY TABLE

The Medium Commodity Supply Table presents additional information underlying the Commodity Intensity Ratios in Tables S1 & T1. Specifically, it shows the average use of each dollar spent on a commodity in Manitoba.

This information is provided to help users determine whether the assumptions used for a given commodity are consistent with their expectations about where commodities originate; Manitoba or not-Manitoba. It also provides an understanding of why the multipliers for different commodities are as presented; why some commodities have larger multipliers than others.

The Manitoba Commodity Supply Table contains the source decomposition of a $1.00 Manitoba commodity purchase for each of 94 commodities, framed as follows:

1. Indirect Leakage from Manitoba Economy
2. Direct Manitoba Supply Content
3. Direct Industry Output (Product Value)
4. Service Markups & Taxes (Marginal Value)

For each $1.00 commodity purchase in Manitoba, producers and suppliers, both inside and outside Manitoba may benefit. The proportion of each dollar expected to flow outside Manitoba is termed an **Indirect Leakage** from the Manitoba economy. This portion of the Manitoba based expenditure provides no further economic spin-off within Manitoba.

The expected proportion of Indirect Leakage tends to be highest for goods not generally produced in Manitoba, and lowest for services (such as Construction) which are typically supplied locally.

Subtracting the Indirect Leakage from the Manitoba Purchase Price ($1.00) reveals the **Manitoba Supply Content,** which represents the expected proportion of the purchase that will be supplied by Manitoba industry. As Manitoba industry is able to respond to commodity demand, economic spin-offs are created.

In general, commodities with a higher Manitoba Supply Content, will produce greater economic benefits in Manitoba (and have larger multipliers) than commodities with little Manitoba Content.

The Direct Manitoba Supply Content of a commodity (as shown in the table) is composed of two pieces; Product Costs and Marginal Costs.

- **Product Costs** are essentially the factory gate price; the proportion of the purchase price received by the producer. Product Costs, include all costs of producing the good or service, including commodity inputs, labour, overhead and profit margin.

- **Marginal Costs** includes the average service costs of delivering each commodity from the producer to the customer, and includes indirect taxes. Different service costs, such as Transportation Margins, Retail Margins, Wholesale Margins and Indirect Taxes are applied differently to each commodity.

The Commodity Supply Table clearly illustrates how spending on different commodities has varying economic impacts on Manitoba. It explains to a large degree why the multipliers for each commodity are what they are; that even commodities not generally produced in Manitoba can have sizeable Manitoba Supply Content.

The following table extracts illustrate how Manitoba Supply Content is built up from Product Costs and Marginal Costs flowing to Manitoba industry, and how Manitoba Supply Content levers economic growth. Commodities in the table extracts are ordered from lowest to highest Manitoba Content.

COMMODITY SOURCE TABLE EXTRACT

Average Composition of $1.00 Manitoba Commodity Purchase

Commodity Description	Indirect Leakage (Non-MB Content)	Direct Manitoba Supply Content	Direct Industry Output (Product Costs)	Service Markups & Taxes (Marginal Costs)
34 Wood Pulp	0.985	0.015	0.000	0.015
28 Clothing & Accessories	0.539	0.461	0.085	0.376
15 Feeds	0.324	0.676	0.636	0.040
55 Concrete & Concrete Products	0.273	0.727	0.618	0.109
65 Construction	0.000	1.000	0.983	0.017

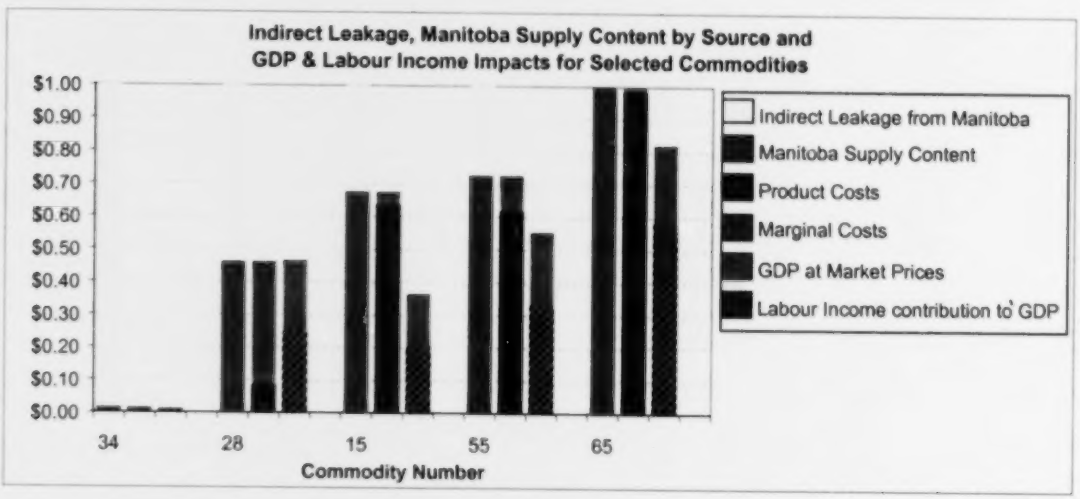
COMMODITY INTENSITY RATIO EXTRACT (TABLE T1)

Estimated Total Impact to Manitoba per Value of Commodity Purchased in Manitoba

Commodity Description	GDP at Market Prices	GDP at Basic Prices	Manitoba Labour Income	Employment (per $1.0 million purchase)	Gross Manitoba Expenditures
34 Wood Pulp	0.012	0.011	0.008	0.230	0.037
28 Clothing & Accessories	0.466	0.343	0.245	8.900	0.655
15 Feeds	0.366	0.342	0.204	6.110	1.177
55 Concrete & Concrete Products	0.554	0.465	0.331	9.470	1.137
65 Construction	0.822	0.751	0.582	16.100	1.706

Commodity 34, Wood Pulp, is entirely imported into Manitoba. For each $1.00 expended locally for Wood Pulp, 98.5 cents on average leaks out of the province, and only 1.5 cents is estimated to remain in Manitoba, primarily the transportation cost. The Manitoba economic impacts of a purchase of Wood Pulp are expected to be small: GDP at Market Prices 1.2 cents per $1.00 expenditure; Labour Income 0.8 cents per $1.00 expenditure; 2.3 Person-Years of Employment per $1.0 million expenditure.

Commodity 28, Clothing & Accessories, is on average 54% supplied from outside Manitoba (Indirect Leakage 0.539) and 46% supplied by Manitoba industry. However, for each $1.00 spent in Manitoba for Clothing & Accessories, only 8.5 cents is estimated to be produced locally, with the remaining Manitoba impact (37.6 cents) estimated to result from wholesale, retail, transportation margins and taxes. With average Manitoba supply content of 46%, the purchase of Clothing & Accessories has much higher impacts (commodity intensity ratios) than Wood Pulp: GDP at Market Prices 46.6 cents per $1.00 expenditure; Labour Income 24.5 cents per $1.00 expenditure; 8.9 Person-Years of Employment per $1.0 million expenditure.



Commodity 15, Feeds, has less indirect leakage (32.4 cents per $1.00 expenditure) and therefore greater Manitoba supply content (67.6 cents per $1.00 expenditure), and considerably more local production (63.6 cents) representing 94% of the Manitoba supply content. Service margins and taxes staying within Manitoba account for 4% of the price of Feeds (4.0 cents per $1.00 expenditure). Although Feeds are largely produced in Manitoba, the economic impacts of this commodity are less than for Clothing and Accessories, because of the comparatively large profits gained through the sale of Clothing & Accessories, and the comparatively low number of jobs required in Crop Production and Feed Manufacturing which are more capital-intensive than labour-intensive. Commodity Intensity Ratios for Feed: GDP at Market Prices 36.6 cents per $1.00 purchase; Labour Income 20.4 cents per $1.00 purchase; 6.11 Person-Years of Employment per $1.0 million purchase.

Commodity 55, Concrete & Concrete Products, have an average Manitoba supply content of 72.7 cents per $1.00 purchase, of which 61.8 cents is attributed to product costs and 10.9 cents is attributed to service margins and taxes. With average Manitoba supply content of 73%, and relatively large service costs, Concrete & Concrete Products has much higher expected impacts than Feeds: GDP at Market Prices 55.4 cents per $1.00 purchase; Labour Income 33.1 cents per $1.00 purchase; 9.47 Person-Years of Employment per $1.0 million purchase.

MANITOBA MEDIUM COMMODITY SUPPLY TABLE

Average Composition of $1.00 Manitoba Commodity Purchase

Commodity Description	Indirect Leakage (Non-MB Content)	Direct Manitoba Supply Content	Direct Industry Output (Product Costs)	Service Markups & Taxes (Marginal Costs)
01 Grains	0.263	0.737	0.673	0.064
02 Live Animals	0.111	0.889	0.871	0.018
03 Other Agricultural Products	0.194	0.806	0.758	0.048
04 Forestry Products	0.479	0.521	0.477	0.044
05 Fishing & Hunting Products	0.627	0.373	0.297	0.076
06 Metal Ores & Concentrates	0.179	0.821	0.809	0.012
07 Coal	0.861	0.139	0.034	0.105
08 Natural Gas (excl liquified)	0.474	0.526	0.001	0.525
09 Non-Metallic Minerals	0.363	0.637	0.501	0.136
10 Services Incidental to Mining	0.393	0.607	0.607	0.000
11 Meat Products	0.695	0.305	0.163	0.142
12 Dairy Products	0.421	0.579	0.419	0.160
13 Fish & Seafood Products	0.744	0.256	0.094	0.162
14 Fruit & Vegetable Products	0.700	0.300	0.039	0.261
15 Feeds	0.324	0.676	0.636	0.040
16 Wheat Flour & Starches	0.490	0.510	0.335	0.175
17 Other Cereal & Bakery Products	0.429	0.571	0.315	0.256
18 Sugar	0.730	0.270	0.001	0.269
19 Miscellaneous Food Products	0.735	0.265	0.074	0.191
20 Soft Drinks	0.401	0.599	0.556	0.043
21 Alcoholic Beverages	0.309	0.691	0.360	0.331
22 Tires & Tubes	0.751	0.249	0.111	0.138
23 Other Rubber Products	0.887	0.113	0.017	0.096
24 Plastics Products	0.779	0.221	0.137	0.084
25 Leather & Leather Products	0.876	0.124	0.018	0.106
26 Yarns & Fibres	0.855	0.145	0.060	0.085
27 Fabrics	0.879	0.121	0.014	0.107
28 Clothing & Accessories	0.539	0.461	0.085	0.376
29 Custom Tailoring	0.003	0.997	0.997	0.000
30 Other Textile Products	0.637	0.363	0.189	0.174
31 Lumber & Treated Wood	0.579	0.421	0.201	0.220
32 Other Wood Products	0.557	0.443	0.318	0.125
33 Furniture & Fixtures	0.414	0.586	0.417	0.169
34 Wood Pulp	0.985	0.015	0.000	0.015
35 Newsprint & Other Paper	0.813	0.187	0.112	0.075
36 Coated Paper & Paper Products	0.587	0.413	0.257	0.156
37 Printed Matter & Publishing Service	0.604	0.396	0.258	0.138
38 Advertising in Print Media	0.200	0.800	0.798	0.002
39 Primary Iron & Steel Products	0.808	0.192	0.109	0.083
40 Aluminum & Aluminum Alloy Products	0.949	0.051	0.010	0.041
41 Copper & Copper Alloy Products	0.948	0.052	0.013	0.039
42 Nickel & Nickel Alloy Products	0.929	0.071	0.051	0.020
43 Other Non-Ferrous Metal Products	0.767	0.233	0.068	0.165
44 Boilers, Tanks & Plates	0.744	0.256	0.137	0.119
45 Structural Metal Building Products	0.525	0.475	0.391	0.084
46 Other Metal Products	0.715	0.285	0.142	0.143
47 Agricultural Machinery	0.774	0.226	0.134	0.092
48 Other Industrial Machinery	0.812	0.188	0.084	0.104
49 Motor Vehicles	0.919	0.081	0.035	0.046
50 Commercial Trailers & Semi-Trailers	0.745	0.255	0.217	0.038

Finally, Commodity 65, Construction, as a service is assumed to be supplied entirely by the Manitoba construction industry; Manitoba supply content $1.00. Product costs account for 98.3% of the cost, and Marginal costs account for 1.7%. With a Manitoba supply content of 100%, the labour intensive activity of construction has the following multipliers: GDP at Market Prices 82.2 cents per $1.00 expenditure; Labour Income 58.2 cents per $1.00 expenditure; 16.1 Person-Years of Employment per $1.0 million expenditure.

As can be seen in the chart, the magnitude of economic impact (GDP, Labour Income, etc.) depends on the type of commodity being purchased, where it is produced and how it is brought to the consumer.

However, in general, imported commodities have relatively small impacts with little trickle down effect. For locally produced commodities, economic impacts reflect sizable business and consumer spin-offs. This is especially true for services which are labour intensive, and thus provide larger induced impacts.

Further commodity examples are provided in the MBS Monitoring Trends Paper: *Commodity Spending Impact on the Provincial Economy*; attached as Appendix C, and available online at *http://mbs.internal/mbsonline/CommodityCompanionTable.pdf* .

MANITOBA MEDIUM COMMODITY SUPPLY TABLE

Average Composition of $1.00 Manitoba Commodity Purchase

Commodity Description	Indirect Leakage (Non-MB Content)	Direct Manitoba Supply Content	Direct Industry Output (Product Costs)	Service Markups & Taxes (Marginal Costs)
51 Motor Vehicle Parts	0.765	0.235	0.056	0.179
52 Other Transport Equipment & Repairs	0.913	0.087	0.077	0.010
53 Appliances & Household Equipment	0.631	0.369	0.017	0.352
54 Other Electrical & Electronic Products	0.791	0.209	0.083	0.126
55 Concrete & Concrete Products	0.273	0.727	0.618	0.109
56 Other Non-Metallic Mineral Products	0.693	0.307	0.165	0.142
57 Gasoline & Fuel Oil	0.583	0.417	0.022	0.395
58 Other Petroleum & Coal Products	0.700	0.300	0.060	0.240
59 Industrial Chemicals	0.877	0.123	0.065	0.058
60 Fertilizers	0.659	0.341	0.247	0.094
61 Pharmaceuticals	0.650	0.350	0.069	0.281
62 Other Chemical Products	0.764	0.236	0.101	0.135
63 Lab., Medical & Photo. Equipment	0.783	0.217	0.070	0.147
64 Other Manufactured Products	0.659	0.341	0.197	0.144
65 Construction	0.000	1.000	0.983	0.017
66 Pipeline Transportation	0.126	0.874	0.874	0.000
67 Air Transportation	0.391	0.609	0.583	0.026
68 Water Transportation	0.731	0.269	0.269	0.000
69 Rail Transportation	0.242	0.758	0.758	0.000
70 Truck Transportation	0.112	0.888	0.887	0.001
71 Other Transportation Services	0.450	0.550	0.541	0.009
72 Storage & Warehousing	0.690	0.310	0.307	0.003
73 Radio & Television Broadcasting	0.512	0.488	0.474	0.014
74 Telephone & Telecommunication Services	0.263	0.737	0.648	0.089
75 Postal Services	0.357	0.643	0.627	0.016
76 Electric Power	0.023	0.977	0.924	0.053
77 Other Utilities	0.000	1.000	1.000	0.000
78 Wholesale & Retail Margins	0.330	0.670	0.665	0.005
79 Financial Institution Fees	0.440	0.560	0.558	0.002
80 Investment & Management Fees	0.249	0.751	0.742	0.009
81 Insurance Services	0.286	0.714	0.714	0.000
82 Rent	0.031	0.969	0.960	0.009
83 Professional Business Services	0.329	0.671	0.661	0.010
84 Computer Services	0.271	0.729	0.699	0.030
85 Other Services to Business	0.570	0.430	0.421	0.009
86 Education Services	0.020	0.980	0.975	0.005
87 Health & Social Services	0.038	0.962	0.962	0.000
88 Accommodation & Food Services	0.380	0.620	0.551	0.069
89 Amusement & Recreation Services	0.675	0.325	0.313	0.012
90 Other Personal & Business Services	0.238	0.762	0.698	0.064
91 Transportation Margins	0.527	0.473	0.473	0.000
92 Miscellaneous Operating Supplies	0.000	1.000	1.000	0.000
93 Misc. Travel, Entertainment & Promotion	0.000	1.000	1.000	0.000
94 Non-Competing Imports	0.930	0.070	0.026	0.044
Direct Wages & Salaries	0.000	1.000	1.000	0.000

Demand for a commodity purchased in Manitoba may be supplied directly by Manitoba Industry, or from outside the Manitoba economy (resulting in Indirect Leakage from Manitoba).
The Manitoba Supply content of each commodity is composed of the Product Costs (which goes to the producing industry) and the Marginal Costs (which goes to retail, wholesale and transportation margins and appropriate taxes).

SECTION 5: MULTIPLIER TABLES

Simple Multiplier Tables:

Simple, or Open Model Multipliers include only the direct and indirect industry effects, not the induced household effects of wage respending.

Page	
30	S1: Manitoba Commodity Intensity Ratios
32	S2: Manitoba Industry Intensity Ratios
33	S3: Manitoba Traditional Industry Multipliers

Total Multiplier Tables:

Total, or Closed Model Multipliers include the direct and indirect industry effects plus induced household effects.

34	T1: Manitoba Commodity Intensity Ratios
36	T2: Manitoba Industry Intensity Ratios
37	T3: Manitoba Traditional Industry Multipliers

MULTIPLIER TABLES - QUICK REFERENCE

The Diagram on Page 26 summarizes how the type of data available for a project determines the type of multiplier to use; Commodity Intensity Ratios, Industry Intensity Ratios or Traditional Industry Multipliers.

If data represents Manitoba Commodity purchases, the dollar value of each purchase times the Commodity Intensity Ratios for appropriate commodities (in Table S1 or T1), provides estimates of the total impacts that may result in terms of Manitoba GDP, Labour Income and Gross Expenditures.

Employment impacts are in person-years per $1.0 million purchase. Therefore, the expenditures data to use with Employment multipliers should be converted to millions of dollars.

Total GDP, Labour Income and Employment impacts are the sum of the impact estimates produced for each commodity. Determination of appropriate medium level commodities is facilitated by the detailed commodity list provided in Appendix A.

It is important to note that only Manitoba based expenditures are to be applied to the multipliers. Where a commodity is purchased (Manitoba or not Manitoba) is the criteria, not where a commodity may originate from. The multipliers for each commodity contain information on the expected origin of commodities purchased in Manitoba.

Data Determines Type of Multiplier to Use

Available Data	Multiplier Table	Procedure
Dollar value of a Change in Demand for a Commodity in Manitoba.	T1 or S1	Locate appropriate commodity in table. Multiply dollar value of change in demand by the Commodity Intensity Ratios.

Dollar value of a Change in Output of an Industry in Manitoba

Only the dollar value of change in output.	T2 or S2	Locate appropriate industry in table. Multiply dollar value of change in output by the Industry Intensity Ratios.
Detailed cost information, sufficient to calculate Direct GDP, Labour Income and Employment.	T3 or S3	Locate appropriate industry in table. Multiply the known direct impacts (to GDP etc.) by the Traditional Industry Multipliers.

If data represents a change in industry output (i.e., gross production of an industry), the net change times the Industry Intensity Ratios for the appropriate industry (in Table S2 or T2), provides estimates of the total impacts that may result in terms of Manitoba GDP, Labour Income and Gross Expenditures.

Employment impacts are in person-years per $1.0 million industry output. Therefore, the net change in output should be converted to millions of dollars.

Selection of the appropriate medium level industry is facilitated by the detailed industry list provided in Appendix B.

If project data consists of detailed cost information such that Direct GDP, Direct Labour Income, Direct Employment and Direct Manitoba Expenditures can be identified, use of Traditional Industry Multipliers (Tables S3 or T3) would be merited. The Traditional Industry Multipliers are able to produce better estimates because the direct impact to economic measures are calculated from project data, rather than relying on industry averages contained in a multiplier. The trade-off is that Traditional Industry Multipliers have much higher data requirements.

For Traditional Industry Multipliers, the given Direct Impact to Manitoba GDP (at Market Prices or Basic Prices) is multiplier by the GDP Multiplier for the appropriate industry. The given Direct Impact to Manitoba Labour Income is multiplier by the Labour Income Multiplier for the appropriate industry. Direct Manitoba Expenditures is multiplied by the Gross Expenditures Multiplier for the appropriate industry. And the Number of Direct Jobs (ideally full-time equivalent, or person-years) is multiplied by the Employment Multiplier for the appropriate industry.

If more than one industry is invoked, Total GDP impacts are the sum of the GDP impacts realized for each industry. Similarly for Gross Expenditures, Labour Income and Employment. Selection of appropriate medium level industries is facilitated by the detailed industry list provided in Appendix B.

With Traditional Industry Multipliers, multiplier results are always in the same units as the input data used. This is especially important to note when defining Direct Jobs for use with the Employment Multipliers.

Three types of Multipliers are presented in two sets of tables; Simple Multipliers (Tables S1, S2 & S3) and Total Multipliers (Tables T1, T2 & T3).

Three types of effects are assumed to occur as a result of a direct change in demand or output; direct and indirect industry effects, and the induced effect of wage re-spending that results from changes in labour income availability (due to increased or decreased direct and indirect production).

The Total Multipliers presented in Tables T1, T2 & T3, include these induced impacts, whereas the Simple Multipliers presented in Tables S1, S2 & S3, include only the direct and indirect industry effects.

Arguments can be made for both sets of multipliers. What is important is for the user to determine whether or not they want to include the induced impacts, and be aware that this distinction exists.

With the inclusion of both Simple and Total Multipliers, it becomes possible to assess the induced impacts separately from the industry effects, by subtracting the Simple Multiplier Result from the Total Multiplier Result. This gives the user flexibility to use all, none, or a portion of the induced impact estimate.

Inclusion or Evaluation of Induced (Wage Respending) Impacts:

Referring to the Commodity Intensity Ratio example on page 16, the Total Multipliers in Table T1 were used to estimate the Manitoba economic impacts of expanding a poultry processing facility.

The $16.0 million capital budget consists of the following Manitoba based expenditures.

$5.0 million for Building Construction (Coded to Commodity 65),

$10.0 million for Other Industrial Machinery (Coded to Commodity 48)

$1.0 million for Installation Labour (Coded to Direct Wages & Salaries)

The average annual wage for installation labour is given as $50,000, therefore Direct Employment is estimated at 20 person-years.

Total Multiplier Impacts using the Commodity Intensity Ratios in Table T1 (Total Multipliers) were estimated as follows:

Manitoba GDP at Market Prices: $7.1 million

Manitoba Labour Income: $4.9 million

Manitoba Employment: 130 person-years

These impact estimates include the Direct impacts of constructing and equipping the facility; the Indirect impacts on suppliers to the project (building materials, transportation, wholesale margins, etc.); and the Induced impacts of household spending made possible by the generation of labour income through Direct and Indirect industry effects.

To produce estimates that include only the Direct and Indirect industry effects, Commodity Intensity Ratios from Table S1 (Simple Multipliers) are applied to the project data as follows:

Manitoba GDP at Market Prices:

$5.0 million x 0.601 = $3.005 million (Commodity 65)
$10.0 million x 0.127 = $1.27 million (Commodity 48)
$1.0 million x 1.000 = $1.00 million (Direct Wages & Salaries)

$5.3 million

Manitoba Labour Income:

$5.0 million x 0.454 = $2.27 million (Commodity 65)
$10.0 million x 0.057 = $0.57 million (Commodity 48)
$1.0 million x 1.000 = $1.00 million (Direct Wages & Salaries)

$3.8 million

Manitoba Employment:

$5.0 million x 12.092 = 60.46 person-years (Commodity 65)
$10.0 million x 1.581 = 15.81 person-years (Commodity 48)
$1.0 million x 0.000 = 0.00 person-years (Direct Wages & Salaries)
+ 20 person-years (Direct Employment)

96 person-years

Notice, that Direct Wages & Salaries have a Direct impact and an Induced impact, but have no Indirect Impact. Therefore, with Simple Multipliers, the impact of Direct Wages & Salaries is equal to the Direct Impact only; $1.0 million GDP, $1.0 million Labour Income and 20 person-years of Employment.

The following Table illustrates further the difference between the Total and Simple Multiplier estimates, for the entire project and for the individual commodities used. This difference is the estimated impact of wage respending in the economy, or the Induced effect.

MULTIPLIER IMPACTS OF $16 MILLION POULTRY EXPANSION

TOTAL PROJECT IMPACTS	TABLE T1: Direct, Indirect & Induced Impacts	TABLE S1: Direct &Indirect Impacts Only	DIFFERENCE Induced Impacts (Wage Respending)
GDP at Market Prices ($M)	7.1	5.3	1.9
Labour Income ($M)	4.9	3.8	1.1
Employment (py's)	130	96	34
MANITOBA GDP IMPACTS ($ Millions)			
Commodity 65	4.11	3.01	1.10
Commodity 48	1.55	1.27	0.28
Direct Wages & Salaries	1.48	1.00	0.48
MANITOBA LABOUR INCOME IMPACTS ($ Millions)			
Commodity 65	2.91	2.27	0.64
Commodity 48	0.72	0.57	0.15
Direct Wages & Salaries	1.28	1.00	0.28
EMPLOYMENT IMPACTS (Person-Years)			
Commodity 65	80.5	60.5	20.0
Commodity 48	20.8	15.8	5.0
Direct Wages & Salaries	28.8	20.0	8.8

Table S1 (Simple Multipliers)

MANITOBA COMMODITY INTENSITY RATIOS

Estimated Total Impact to Manitoba per Value of Commodity Purchased in Manitoba

Commodity Description	Gross Domestic Product (GDP) at Market Prices	Gross Domestic Product (GDP) at Basic Prices	Manitoba Labour Income	Employment (per $1.0 million purchase)	Gross Manitoba Expenditures
01 Grains	0.443	0.429	0.171	6.012	1.028
02 Live Animals	0.535	0.514	0.257	8.729	1.661
03 Other Agricultural Products	0.501	0.480	0.228	7.651	1.222
04 Forestry Products	0.350	0.317	0.310	9.073	1.114
05 Fishing & Hunting Products	0.253	0.232	0.091	3.158	0.537
06 Metal Ores & Concentrates	0.605	0.564	0.405	8.005	1.117
07 Coal	0.074	0.055	0.038	1.076	0.168
08 Natural Gas (excl liquified)	0.475	0.335	0.125	2.853	0.548
09 Non-Metallic Minerals	0.441	0.374	0.237	5.809	0.855
10 Services Incidental to Mining	0.448	0.420	0.363	6.670	0.820
11 Meat Products	0.205	0.193	0.124	4.212	0.516
12 Dairy Products	0.362	0.342	0.195	6.619	1.155
13 Fish & Seafood Products	0.171	0.159	0.109	3.760	0.371
14 Fruit & Vegetable Products	0.229	0.206	0.148	5.317	0.436
15 Feeds	0.288	0.272	0.159	4.705	1.054
16 Wheat Flour & Starches	0.287	0.269	0.176	5.672	0.826
17 Other Cereal & Bakery Products	0.414	0.381	0.272	9.322	0.803
18 Sugar	0.211	0.195	0.137	4.759	0.398
19 Miscellaneous Food Products	0.180	0.163	0.114	3.826	0.401
20 Soft Drinks	0.268	0.248	0.132	3.775	0.864
21 Alcoholic Beverages	0.571	0.258	0.196	7.282	0.581
22 Tires & Tubes	0.190	0.145	0.102	3.161	0.299
23 Other Rubber Products	0.087	0.052	0.034	1.024	0.120
24 Plastics Products	0.138	0.104	0.069	2.033	0.258
25 Leather & Leather Products	0.097	0.072	0.051	1.797	0.152
26 Yarns & Fibres	0.094	0.086	0.053	1.549	0.204
27 Fabrics	0.095	0.074	0.051	1.757	0.152
28 Clothing & Accessories	0.373	0.258	0.192	7.209	0.507
29 Custom Tailoring	0.677	0.663	0.360	11.221	1.221
30 Other Textile Products	0.242	0.183	0.143	4.677	0.443
31 Lumber & Treated Wood	0.288	0.246	0.175	5.427	0.598
32 Other Wood Products	0.289	0.247	0.165	5.053	0.611
33 Furniture & Fixtures	0.379	0.333	0.225	6.717	0.775
34 Wood Pulp	0.009	0.008	0.006	0.175	0.032
35 Newsprint & Other Paper	0.128	0.115	0.062	1.789	0.270
36 Coated Paper & Paper Products	0.236	0.190	0.138	4.141	0.496
37 Printed Matter & Publishing Service	0.282	0.216	0.151	4.480	0.442
38 Advertising in Print Media	0.676	0.661	0.417	11.765	1.020
39 Primary Iron & Steel Products	0.124	0.107	0.070	1.913	0.262
40 Aluminum & Aluminum Alloy Products	0.036	0.034	0.023	0.643	0.076
41 Copper & Copper Alloy Products	0.038	0.034	0.021	0.561	0.081
42 Nickel & Nickel Alloy Products	0.046	0.041	0.029	0.671	0.139
43 Other Non-Ferrous Metal Products	0.171	0.157	0.103	2.720	0.351
44 Boilers, Tanks & Plates	0.181	0.112	0.093	2.430	0.273
45 Structural Metal Building Products	0.286	0.237	0.170	4.637	0.582
46 Other Metal Products	0.192	0.144	0.109	3.092	0.322
47 Agricultural Machinery	0.122	0.104	0.066	1.909	0.295
48 Other Industrial Machinery	0.127	0.084	0.057	1.581	0.196
49 Motor Vehicles	0.061	0.058	0.032	0.914	0.109
50 Commercial Trailers & Semi-Trailers	0.140	0.114	0.085	2.150	0.295

Note: Simple Multipliers include the Direct and Indirect Industry impacts, but do not include Induced impacts.

Table S1 (Simple Multipliers)

MANITOBA COMMODITY INTENSITY RATIOS

Estimated Total Impact to Manitoba per Value of Commodity Purchased in Manitoba

Commodity Description	Gross Domestic Product (GDP) at Market Prices	Gross Domestic Product (GDP) at Basic Prices	Manitoba Labour Income	Employment (per $1.0 million purchase)	Gross Manitoba Expenditures
51 Motor Vehicle Parts	0.174	0.145	0.100	3.227	0.302
52 Other Transport Equipment & Repairs	0.055	0.051	0.035	0.964	0.113
53 Appliances & Household Equipment	0.305	0.199	0.146	5.274	0.396
54 Other Electrical & Electronic Products	0.144	0.092	0.067	2.000	0.210
55 Concrete & Concrete Products	0.429	0.350	0.259	7.187	0.938
56 Other Non-Metallic Mineral Products	0.220	0.177	0.103	3.091	0.384
57 Gasoline & Fuel Oil	0.367	0.095	0.056	1.659	0.194
58 Other Petroleum & Coal Products	0.233	0.160	0.089	2.722	0.354
59 Industrial Chemicals	0.085	0.075	0.039	1.085	0.166
60 Fertilizers	0.228	0.213	0.101	3.127	0.538
61 Pharmaceuticals	0.261	0.222	0.161	5.725	0.484
62 Other Chemical Products	0.164	0.132	0.077	2.346	0.293
63 Lab., Medical & Photo. Equipment	0.168	0.114	0.082	2.591	0.230
64 Other Manufactured Products	0.239	0.179	0.115	3.522	0.398
65 Construction	0.601	0.551	0.454	12.092	1.355
66 Pipeline Transportation	0.764	0.701	0.108	2.902	1.132
67 Air Transportation	0.392	0.344	0.258	7.290	0.827
68 Water Transportation	0.230	0.226	0.123	3.826	0.333
69 Rail Transportation	0.567	0.524	0.387	10.895	1.023
70 Truck Transportation	0.675	0.609	0.458	13.002	1.278
71 Other Transportation Services	0.455	0.445	0.348	11.030	0.755
72 Storage & Warehousing	0.253	0.225	0.151	4.437	0.418
73 Radio & Television Broadcasting	0.321	0.290	0.199	5.411	0.679
74 Telephone & Telecommunication Services	0.606	0.493	0.247	6.608	0.835
75 Postal Services	0.551	0.514	0.493	13.358	0.856
76 Electric Power	0.929	0.837	0.217	4.684	1.027
77 Other Utilities	0.859	0.786	0.464	10.901	1.338
78 Wholesale & Retail Margins	0.521	0.477	0.311	9.776	0.962
79 Financial Institution Fees	0.499	0.461	0.288	7.673	0.696
80 Investment & Management Fees	0.573	0.517	0.426	10.432	1.229
81 Insurance Services	0.587	0.532	0.391	9.807	1.087
82 Rent	0.834	0.656	0.334	9.488	1.352
83 Professional Business Services	0.554	0.525	0.425	10.552	0.900
84 Computer Services	0.543	0.483	0.285	7.576	1.047
85 Other Services to Business	0.363	0.339	0.290	9.373	0.567
86 Education Services	0.833	0.782	0.681	19.488	1.459
87 Health & Social Services	0.852	0.836	0.759	18.405	1.180
88 Accommodation & Food Services	0.450	0.346	0.268	10.288	0.782
89 Amusement & Recreation Services	0.191	0.175	0.135	4.313	0.481
90 Other Personal & Business Services	0.629	0.530	0.379	12.484	0.959
91 Transportation Margins	0.285	0.262	0.195	5.547	1.001
92 Miscellaneous Operating Supplies	0.177	0.166	0.113	3.407	1.363
93 Misc. Travel, Entertainment & Promotion	0.426	0.399	0.285	9.058	1.813
94 Non-Competing Imports	0.035	0.032	0.023	0.799	0.067
Direct Wages & Salaries	1.000	1.000	1.000	0.000 Plus Direct Person Years	1.000

Note: Simple Multipliers include the Direct and Indirect Industry impacts, but do not include Induced impacts.

Table S2 (Simple Multipliers)

MANITOBA INDUSTRY INTENSITY RATIOS

Estimated Total Impact to Manitoba per Value of Production

Industry Description	Gross Domestic Product (GDP) at Market Prices	Gross Domestic Product (GDP) at Basic Prices	Manitoba Labour Income	Employment (per $1.0 million production)	Gross Manitoba Expenditures
1 Agriculture, Crop Production	0.599	0.582	0.227	8.208	1.362
2 Agriculture, Livestock Production	0.601	0.578	0.289	9.826	1.865
3 Mining & Mineral Extraction Industries	0.745	0.691	0.452	9.033	1.350
4 Other Primary Industries	0.680	0.622	0.556	16.382	2.024
5 Electric Power Generation & Distribution	0.948	0.906	0.235	5.068	1.112
6 Natural Gas Distribution	0.876	0.718	0.371	8.223	1.247
7 Water, Sewage & Other Systems	0.589	0.556	0.281	6.414	1.667
8 Construction	0.601	0.551	0.454	12.092	1.355
9 Food & Beverage Manufacturing	0.523	0.502	0.256	7.713	1.771
10 Alcoholic Beverage & Tobacco Manufacturing	0.405	0.350	0.328	9.234	1.461
11 Textiles And Textile Product Manufacturing	0.508	0.483	0.414	12.948	1.298
12 Clothing Manufacturing	0.624	0.611	0.337	10.628	1.218
13 Leather & Leather Product Manufacturing	0.478	0.465	0.289	8.739	1.229
14 Wood Product Manufacturing	0.554	0.534	0.331	9.857	1.437
15 Paper Manufacturing	0.558	0.533	0.315	8.953	1.343
16 Printing & Related Support Activities	0.603	0.585	0.421	11.674	1.245
17 Petroleum & Coal Product Manufacturing	0.601	0.575	0.235	6.676	1.399
18 Chemical Manufacturing	0.574	0.542	0.217	5.995	1.364
19 Plastic & Rubber Product Manufacturing	0.548	0.531	0.302	8.516	1.220
20 Non-Metallic Mineral Product Manufacturing	0.610	0.578	0.355	9.980	1.365
21 Iron & Steel Mills & Primary Shapes	0.524	0.501	0.244	6.575	1.330
22 Non-Ferrous Smelting & Primary Production	0.641	0.595	0.421	8.833	1.958
23 Fabricated Metal Product Manufacturing	0.571	0.547	0.411	10.958	1.247
24 Agricultural Implement Manufacturing	0.412	0.398	0.168	4.492	1.244
25 Other Machinery Manufacturing	0.557	0.544	0.379	9.956	1.267
26 Computer & Electronics Manufacturing	0.339	0.329	0.300	8.042	1.229
27 Electrical Equipment & Component Manufacturing	0.455	0.436	0.326	9.037	1.215
28 Transportation Equipment Manufacturing	0.483	0.472	0.335	8.514	1.176
29 Furniture Manufacturing	0.574	0.555	0.376	10.910	1.344
30 Miscellaneous Manufacturing	0.392	0.378	0.218	5.751	1.182
31 Wholesale Trade	0.781	0.720	0.447	12.365	1.461
32 Retail Trade	0.827	0.759	0.602	24.003	1.435
33 Truck Transportation	0.759	0.686	0.516	14.655	1.442
34 Transit & Ground Passenger Transportation	0.772	1.005	0.888	27.866	1.352
35 Pipeline Transportation	0.878	0.805	0.120	3.240	1.282
36 Air, Rail & Water Transportation & Support	0.695	0.653	0.484	13.800	1.386
37 Postal & Messenger Services	0.830	0.794	0.724	19.664	1.408
38 Warehousing & Storage	0.800	0.721	0.532	15.503	1.342
39 Motion Picture & Sound Recording Industries	0.513	0.492	0.300	9.652	1.502
40 Broadcasting & Telecommunications	0.766	0.727	0.368	10.031	1.314
41 Information & Data Services, Including Publishing	0.777	0.752	0.459	12.916	1.402
42 Finance, Insurance & Real Estate Services	0.876	0.765	0.436	11.586	1.361
43 Professional, Scientific & Technical Services	0.819	0.789	0.647	15.870	1.380
44 Administrative & Support Services	0.865	0.826	0.661	23.158	1.319
45 Health Care Services	0.866	0.875	0.766	18.928	1.258
46 Arts & Entertainment	0.764	0.700	0.551	18.845	1.645
47 Accommodation Services	0.763	0.683	0.510	19.377	1.386
48 Food & Beverage Services	0.647	0.602	0.493	19.418	1.422
49 Repair Maintenance Services	0.812	0.769	0.619	20.755	1.391
50 Grant-Making, Civic, Professional & Similar Org.	0.929	0.914	0.828	30.942	1.189
51 Personal & Household Services	0.866	0.825	0.640	21.998	1.232

Note: Simple Multipliers include the Direct and Indirect Industry impacts, but do not include Induced impacts.

Table S3 (Simple Multipliers)

MANITOBA TRADITIONAL INDUSTRY MULTIPLIERS

Estimated Total Impact to Manitoba per Value of Direct Impact to Economic Measures

Industry Description	Total GDP at Market Prices per value of Direct GDP at Market Prices	Total GDP at Basic Prices per value of Direct GDP at Basic Prices	Total Labour Income per value of Direct Labour Income	Total Employment per value of Direct Employment	Total Gross Expenditures per value of Direct Expenditure
1 Agriculture, Crop Production	1.403	1.387	1.697	1.498	1.362
2 Agriculture, Livestock Production	2.498	2.485	2.629	2.245	1.865
3 Mining & Mineral Extraction Industries	1.314	1.318	1.334	1.487	1.350
4 Other Primary Industries	2.000	2.010	2.018	1.958	2.024
5 Electric Power Generation & Distribution	1.074	1.073	1.263	1.325	1.112
6 Natural Gas Distribution	1.140	1.164	1.255	1.323	1.247
7 Water, Sewage & Other Systems	1.202	1.200	1.307	1.451	1.667
8 Construction	1.411	1.429	1.357	1.364	1.355
9 Food & Beverage Manufacturing	2.152	2.144	2.145	2.322	1.771
10 Alcoholic Beverage & Tobacco Manufacturing	1.906	2.063	1.555	1.599	1.461
11 Textiles And Textile Product Manufacturing	1.330	1.324	1.239	1.220	1.298
12 Clothing Manufacturing	1.197	1.188	1.223	1.202	1.218
13 Leather & Leather Product Manufacturing	1.277	1.262	1.260	1.237	1.229
14 Wood Product Manufacturing	1.460	1.437	1.561	1.545	1.437
15 Paper Manufacturing	1.341	1.330	1.374	1.374	1.343
16 Printing & Related Support Activities	1.231	1.220	1.194	1.200	1.245
17 Petroleum & Coal Product Manufacturing	1.454	1.435	1.880	1.857	1.399
18 Chemical Manufacturing	1.407	1.407	1.689	1.711	1.364
19 Plastic & Rubber Product Manufacturing	1.234	1.224	1.249	1.251	1.220
20 Non-Metallic Mineral Product Manufacturing	1.386	1.377	1.400	1.390	1.365
21 Iron & Steel Mills & Primary Shapes	1.433	1.418	1.525	1.554	1.330
22 Non-Ferrous Smelting & Primary Production	5.140	5.277	4.426	3.985	1.958
23 Fabricated Metal Product Manufacturing	1.239	1.233	1.177	1.182	1.247
24 Agricultural Implement Manufacturing	1.386	1.370	1.726	1.799	1.244
25 Other Machinery Manufacturing	1.283	1.270	1.242	1.268	1.267
26 Computer & Electronics Manufacturing	1.391	1.377	1.291	1.309	1.229
27 Electrical Equipment & Component Manufacturing	1.277	1.268	1.232	1.234	1.215
28 Transportation Equipment Manufacturing	1.203	1.194	1.186	1.209	1.176
29 Furniture Manufacturing	1.361	1.346	1.321	1.328	1.344
30 Miscellaneous Manufacturing	1.268	1.258	1.307	1.332	1.182
31 Wholesale Trade	1.361	1.355	1.404	1.421	1.461
32 Retail Trade	1.337	1.328	1.248	1.161	1.435
33 Truck Transportation	1.435	1.441	1.411	1.419	1.442
34 Transit & Ground Passenger Transportation	1.302	1.199	1.150	1.142	1.352
35 Pipeline Transportation	1.173	1.178	2.950	2.987	1.282
36 Air, Rail & Water Transportation & Support	1.389	1.389	1.378	1.383	1.386
37 Postal & Messenger Services	1.316	1.302	1.232	1.256	1.408
38 Warehousing & Storage	1.269	1.273	1.234	1.221	1.342
39 Motion Picture & Sound Recording Industries	1.561	1.526	1.564	1.470	1.502
40 Broadcasting & Telecommunications	1.207	1.203	1.320	1.339	1.314
41 Information & Data Services, Including Publishing	1.231	1.221	1.270	1.264	1.402
42 Finance, Insurance & Real Estate Services	1.241	1.258	1.379	1.372	1.361
43 Professional, Scientific & Technical Services	1.246	1.230	1.182	1.223	1.380
44 Administrative & Support Services	1.206	1.195	1.163	1.131	1.319
45 Health Care Services	1.150	1.133	1.094	1.110	1.258
46 Arts & Entertainment	1.570	1.576	1.512	1.520	1.645
47 Accommodation Services	1.278	1.293	1.258	1.190	1.386
48 Food & Beverage Services	1.399	1.385	1.254	1.174	1.422
49 Repair Maintenance Services	1.198	1.187	1.147	1.122	1.391
50 Grant-Making, Civic, Professional & Similar Org.	1.090	1.083	1.061	1.047	1.189
51 Personal & Household Services	1.146	1.139	1.118	1.094	1.232

Note: Simple Multipliers include the Direct and Indirect Industry impacts, but do not include Induced impacts.

Table T1 (Total Multipliers)

MANITOBA COMMODITY INTENSITY RATIOS

Estimated Total Impact to Manitoba per Value of Commodity Purchased in Manitoba

Commodity Description	Gross Domestic Product (GDP) at Market Prices	Gross Domestic Product (GDP) at Basic Prices	Manitoba Labour Income	Employment (per $1.0 million purchase)	Gross Manitoba Expenditures
01 Grains	0.526	0.504	0.219	7.520	1.160
02 Live Animals	0.660	0.627	0.330	11.000	1.860
03 Other Agricultural Products	0.611	0.581	0.292	9.660	1.398
04 Forestry Products	0.501	0.454	0.397	11.810	1.354
05 Fishing & Hunting Products	0.297	0.272	0.116	3.960	0.608
06 Metal Ores & Concentrates	0.802	0.743	0.519	11.580	1.430
07 Coal	0.093	0.072	0.048	1.410	0.197
08 Natural Gas (excl liquified)	0.536	0.391	0.161	3.960	0.645
09 Non-Metallic Minerals	0.556	0.479	0.304	7.900	1.038
10 Services Incidental to Mining	0.624	0.580	0.464	9.870	1.100
11 Meat Products	0.266	0.248	0.159	5.310	0.612
12 Dairy Products	0.457	0.428	0.250	8.340	1.306
13 Fish & Seafood Products	0.224	0.207	0.139	4.720	0.455
14 Fruit & Vegetable Products	0.301	0.271	0.189	6.620	0.550
15 Feeds	0.366	0.342	0.204	6.110	1.177
16 Wheat Flour & Starches	0.372	0.346	0.225	7.220	0.961
17 Other Cereal & Bakery Products	0.546	0.501	0.348	11.720	1.013
18 Sugar	0.278	0.255	0.176	5.970	0.504
19 Miscellaneous Food Products	0.235	0.213	0.146	4.830	0.488
20 Soft Drinks	0.332	0.306	0.169	4.940	0.966
21 Alcoholic Beverages	0.666	0.345	0.251	9.010	0.733
22 Tires & Tubes	0.240	0.190	0.130	4.060	0.377
23 Other Rubber Products	0.104	0.067	0.043	1.320	0.146
24 Plastics Products	0.171	0.135	0.088	2.640	0.311
25 Leather & Leather Products	0.121	0.095	0.066	2.250	0.191
26 Yarns & Fibres	0.120	0.109	0.068	2.020	0.245
27 Fabrics	0.120	0.096	0.066	2.210	0.192
28 Clothing & Accessories	0.466	0.343	0.245	8.900	0.655
29 Custom Tailoring	0.852	0.822	0.461	14.400	1.500
30 Other Textile Products	0.312	0.246	0.183	5.940	0.554
31 Lumber & Treated Wood	0.373	0.323	0.224	6.970	0.733
32 Other Wood Products	0.369	0.320	0.211	6.510	0.739
33 Furniture & Fixtures	0.488	0.433	0.288	8.700	0.949
34 Wood Pulp	0.012	0.011	0.008	0.230	0.037
35 Newsprint & Other Paper	0.158	0.143	0.080	2.340	0.318
36 Coated Paper & Paper Products	0.303	0.251	0.177	5.360	0.603
37 Printed Matter & Publishing Service	0.355	0.282	0.193	5.810	0.558
38 Advertising in Print Media	0.878	0.845	0.533	15.440	1.342
39 Primary Iron & Steel Products	0.158	0.138	0.090	2.530	0.316
40 Aluminum & Aluminum Alloy Products	0.048	0.044	0.030	0.850	0.094
41 Copper & Copper Alloy Products	0.048	0.043	0.027	0.750	0.098
42 Nickel & Nickel Alloy Products	0.060	0.054	0.038	0.930	0.162
43 Other Non-Ferrous Metal Products	0.221	0.202	0.132	3.630	0.430
44 Boilers, Tanks & Plates	0.226	0.153	0.119	3.250	0.344
45 Structural Metal Building Products	0.369	0.312	0.218	6.140	0.714
46 Other Metal Products	0.245	0.192	0.139	4.050	0.406
47 Agricultural Machinery	0.154	0.134	0.084	2.490	0.346
48 Other Industrial Machinery	0.155	0.109	0.072	2.080	0.240
49 Motor Vehicles	0.077	0.072	0.042	1.200	0.134
50 Commercial Trailers & Semi-Trailers	0.181	0.152	0.109	2.900	0.360

Note: Total Multipliers include the Direct and Indirect Industry impacts and the Induced impact of wage re-spending.

Table T1 (Total Multipliers)

MANITOBA COMMODITY INTENSITY RATIOS

Estimated Total Impact to Manitoba per Value of Commodity Purchased in Manitoba

Commodity Description	Gross Domestic Product (GDP) at Market Prices	Gross Domestic Product (GDP) at Basic Prices	Manitoba Labour Income	Employment (per $1.0 million purchase)	Gross Manitoba Expenditures
51 Motor Vehicle Parts	0.223	0.190	0.128	4.110	0.379
52 Other Transport Equipment & Repairs	0.071	0.066	0.044	1.270	0.140
53 Appliances & Household Equipment	0.375	0.264	0.187	6.560	0.508
54 Other Electrical & Electronic Products	0.176	0.121	0.086	2.590	0.261
55 Concrete & Concrete Products	0.554	0.465	0.331	9.470	1.137
56 Other Non-Metallic Mineral Products	0.270	0.222	0.132	4.000	0.464
57 Gasoline & Fuel Oil	0.394	0.119	0.071	2.150	0.237
58 Other Petroleum & Coal Products	0.276	0.200	0.114	3.510	0.423
59 Industrial Chemicals	0.104	0.092	0.050	1.430	0.196
60 Fertilizers	0.277	0.258	0.130	4.020	0.616
61 Pharmaceuticals	0.339	0.293	0.207	7.150	0.608
62 Other Chemical Products	0.202	0.166	0.099	3.030	0.353
63 Lab., Medical & Photo. Equipment	0.208	0.150	0.104	3.310	0.293
64 Other Manufactured Products	0.295	0.230	0.148	4.540	0.487
65 Construction	0.822	0.751	0.582	16.100	1.706
66 Pipeline Transportation	0.817	0.749	0.138	3.850	1.215
67 Air Transportation	0.517	0.458	0.331	9.570	1.026
68 Water Transportation	0.289	0.280	0.157	4.910	0.428
69 Rail Transportation	0.754	0.695	0.496	14.310	1.322
70 Truck Transportation	0.897	0.811	0.586	17.040	1.631
71 Other Transportation Services	0.624	0.599	0.446	14.100	1.024
72 Storage & Warehousing	0.327	0.292	0.194	5.770	0.534
73 Radio & Television Broadcasting	0.418	0.378	0.255	7.170	0.833
74 Telephone & Telecommunication Services	0.726	0.602	0.317	8.790	1.026
75 Postal Services	0.790	0.732	0.632	17.710	1.237
76 Electric Power	1.035	0.933	0.278	6.600	1.195
77 Other Utilities	1.084	0.991	0.593	14.990	1.696
78 Wholesale & Retail Margins	0.672	0.614	0.398	12.520	1.202
79 Financial Institution Fees	0.639	0.588	0.368	10.210	0.918
80 Investment & Management Fees	0.780	0.705	0.545	14.190	1.558
81 Insurance Services	0.777	0.705	0.501	13.260	1.389
82 Rent	0.995	0.803	0.427	12.430	1.610
83 Professional Business Services	0.760	0.713	0.544	14.300	1.228
84 Computer Services	0.681	0.609	0.365	10.090	1.267
85 Other Services to Business	0.504	0.467	0.371	11.930	0.791
86 Education Services	1.163	1.083	0.873	25.500	1.985
87 Health & Social Services	1.220	1.171	0.972	25.100	1.766
88 Accommodation & Food Services	0.580	0.464	0.343	12.650	0.989
89 Amusement & Recreation Services	0.256	0.235	0.172	5.500	0.585
90 Other Personal & Business Services	0.813	0.698	0.486	15.830	1.251
91 Transportation Margins	0.379	0.348	0.250	7.270	1.152
92 Miscellaneous Operating Supplies	0.231	0.216	0.144	4.400	1.450
93 Misc. Travel, Entertainment & Promotion	0.564	0.525	0.365	11.570	2.033
94 Non-Competing Imports	0.046	0.042	0.029	1.000	0.084
Direct Wages & Salaries	1.485	1.442	1.281	8.830 Plus Direct Person Years	1.773

Note: Total Multipliers include the Direct and Indirect Industry impacts and the Induced impact of wage re-spending.

Table T2 (Total Multipliers)

MANITOBA INDUSTRY INTENSITY RATIOS

Estimated Total Impact to Manitoba per Value of Production

Industry Description	Gross Domestic Product (GDP) at Market Prices	Gross Domestic Product (GDP) at Basic Prices	Manitoba Labour Income	Employment (per $1.0 million production)	Gross Manitoba Expenditures
1 Agriculture, Crop Production	0.709	0.683	0.291	10.210	1.537
2 Agriculture, Livestock Production	0.741	0.706	0.371	12.380	2.088
3 Mining & Mineral Extraction Industries	0.965	0.891	0.579	13.020	1.699
4 Other Primary Industries	0.950	0.868	0.712	21.290	2.453
5 Electric Power Generation & Distribution	1.062	1.009	0.301	7.140	1.293
6 Natural Gas Distribution	1.056	0.882	0.476	11.500	1.534
7 Water, Sewage & Other Systems	0.725	0.680	0.359	8.890	1.884
8 Construction	0.822	0.751	0.582	16.100	1.706
9 Food & Beverage Manufacturing	0.647	0.615	0.328	9.970	1.968
10 Alcoholic Beverage & Tobacco Manufacturing	0.564	0.495	0.420	12.130	1.714
11 Textiles And Textile Product Manufacturing	0.709	0.666	0.530	16.600	1.617
12 Clothing Manufacturing	0.788	0.760	0.431	13.600	1.479
13 Leather & Leather Product Manufacturing	0.619	0.592	0.370	11.290	1.452
14 Wood Product Manufacturing	0.715	0.680	0.424	12.780	1.693
15 Paper Manufacturing	0.711	0.672	0.403	11.730	1.587
16 Printing & Related Support Activities	0.807	0.771	0.539	15.390	1.570
17 Petroleum & Coal Product Manufacturing	0.715	0.679	0.301	8.750	1.581
18 Chemical Manufacturing	0.680	0.638	0.278	7.910	1.532
19 Plastic & Rubber Product Manufacturing	0.694	0.664	0.387	11.180	1.453
20 Non-Metallic Mineral Product Manufacturing	0.782	0.735	0.454	13.110	1.639
21 Iron & Steel Mills & Primary Shapes	0.643	0.609	0.313	8.730	1.519
22 Non-Ferrous Smelting & Primary Production	0.845	0.781	0.540	12.550	2.284
23 Fabricated Metal Product Manufacturing	0.770	0.729	0.526	14.580	1.564
24 Agricultural Implement Manufacturing	0.493	0.472	0.215	5.970	1.374
25 Other Machinery Manufacturing	0.741	0.711	0.485	13.300	1.559
26 Computer & Electronics Manufacturing	0.485	0.461	0.384	10.690	1.461
27 Electrical Equipment & Component Manufacturing	0.613	0.580	0.417	11.910	1.467
28 Transportation Equipment Manufacturing	0.646	0.620	0.429	11.470	1.435
29 Furniture Manufacturing	0.756	0.721	0.482	14.230	1.635
30 Miscellaneous Manufacturing	0.498	0.474	0.279	7.670	1.350
31 Wholesale Trade	0.998	0.917	0.573	16.310	1.807
32 Retail Trade	1.119	1.024	0.770	29.310	1.900
33 Truck Transportation	1.010	0.914	0.661	19.210	1.840
34 Transit & Ground Passenger Transportation	1.203	1.397	1.137	35.700	2.037
35 Pipeline Transportation	0.937	0.858	0.154	4.300	1.375
36 Air, Rail & Water Transportation & Support	0.930	0.867	0.620	18.070	1.759
37 Postal & Messenger Services	1.182	1.114	0.927	26.050	1.967
38 Warehousing & Storage	1.058	0.956	0.682	20.200	1.753
39 Motion Picture & Sound Recording Industries	0.659	0.625	0.384	12.300	1.733
40 Broadcasting & Telecommunications	0.945	0.890	0.472	13.280	1.598
41 Information & Data Services, Including Publishing	1.000	0.955	0.588	16.970	1.756
42 Finance, Insurance & Real Estate Services	1.087	0.957	0.558	15.430	1.697
43 Professional, Scientific & Technical Services	1.133	1.075	0.829	21.580	1.879
44 Administrative & Support Services	1.186	1.118	0.846	28.990	1.830
45 Health Care Services	1.238	1.213	0.981	25.690	1.850
46 Arts & Entertainment	1.032	0.944	0.706	23.710	2.071
47 Accommodation Services	1.011	0.909	0.654	23.880	1.780
48 Food & Beverage Services	0.887	0.820	0.632	23.770	1.803
49 Repair Maintenance Services	1.112	1.043	0.793	26.220	1.869
50 Grant-Making, Civic, Professional & Similar Org.	1.331	1.280	1.061	38.250	1.828
51 Personal & Household Services	1.176	1.108	0.819	27.640	1.726

Note: Total Multipliers include the Direct and Indirect Industry impacts and the Induced impact of wage re-spending.

Table T3 (Total Multipliers)

MANITOBA TRADITIONAL INDUSTRY MULTIPLIERS

Estimated Total Impact to Manitoba per Value of Direct Impact to Economic Measures

Industry Description	Total GDP at Market Prices per value of Direct GDP at Market Prices	Total GDP at Basic Prices per value of Direct GDP at Basic Prices	Total Labour Income per value of Direct Labour Income	Total Employment per value of Direct Employment	Total Gross Expenditures per value of Direct Expenditure
1 Agriculture, Crop Production	1.660	1.626	2.174	1.864	1.537
2 Agriculture, Livestock Production	3.081	3.035	3.369	2.828	2.088
3 Mining & Mineral Extraction Industries	1.700	1.699	1.709	2.144	1.699
4 Other Primary Industries	2.793	2.804	2.585	2.544	2.453
5 Electric Power Generation & Distribution	1.202	1.196	1.618	1.867	1.293
6 Natural Gas Distribution	1.374	1.430	1.607	1.850	1.534
7 Water, Sewage & Other Systems	1.480	1.467	1.674	2.011	1.884
8 Construction	1.928	1.951	1.739	1.816	1.706
9 Food & Beverage Manufacturing	2.662	2.627	2.748	3.002	1.968
10 Alcoholic Beverage & Tobacco Manufacturing	2.655	2.919	1.992	2.101	1.714
11 Textiles And Textile Product Manufacturing	1.855	1.826	1.587	1.564	1.617
12 Clothing Manufacturing	1.510	1.478	1.567	1.538	1.479
13 Leather & Leather Product Manufacturing	1.651	1.610	1.615	1.598	1.452
14 Wood Product Manufacturing	1.883	1.831	1.999	2.004	1.693
15 Paper Manufacturing	1.707	1.678	1.761	1.799	1.587
16 Printing & Related Support Activities	1.648	1.609	1.529	1.582	1.570
17 Petroleum & Coal Product Manufacturing	1.729	1.694	2.408	2.433	1.581
18 Chemical Manufacturing	1.665	1.656	2.164	2.258	1.532
19 Plastic & Rubber Product Manufacturing	1.564	1.532	1.600	1.643	1.453
20 Non-Metallic Mineral Product Manufacturing	1.777	1.751	1.794	1.825	1.639
21 Iron & Steel Mills & Primary Shapes	1.757	1.724	1.953	2.063	1.519
22 Non-Ferrous Smelting & Primary Production	6.778	6.929	5.670	5.662	2.284
23 Fabricated Metal Product Manufacturing	1.671	1.642	1.508	1.572	1.564
24 Agricultural Implement Manufacturing	1.660	1.625	2.212	2.391	1.374
25 Other Machinery Manufacturing	1.706	1.662	1.592	1.694	1.559
26 Computer & Electronics Manufacturing	1.987	1.933	1.654	1.740	1.461
27 Electrical Equipment & Component Manufacturing	1.720	1.687	1.579	1.627	1.467
28 Transportation Equipment Manufacturing	1.607	1.568	1.519	1.629	1.435
29 Furniture Manufacturing	1.794	1.750	1.692	1.732	1.635
30 Miscellaneous Manufacturing	1.609	1.578	1.674	1.776	1.350
31 Wholesale Trade	1.739	1.727	1.799	1.874	1.807
32 Retail Trade	1.809	1.793	1.599	1.418	1.900
33 Truck Transportation	1.907	1.920	1.808	1.860	1.840
34 Transit & Ground Passenger Transportation	2.027	1.668	1.474	1.464	2.037
35 Pipeline Transportation	1.251	1.256	3.779	3.964	1.375
36 Air, Rail & Water Transportation & Support	1.858	1.844	1.765	1.811	1.759
37 Postal & Messenger Services	1.872	1.827	1.578	1.663	1.967
38 Warehousing & Storage	1.679	1.689	1.581	1.591	1.753
39 Motion Picture & Sound Recording Industries	2.003	1.937	2.004	1.873	1.733
40 Broadcasting & Telecommunications	1.488	1.472	1.691	1.772	1.598
41 Information & Data Services, Including Publishing	1.583	1.550	1.627	1.661	1.756
42 Finance, Insurance & Real Estate Services	1.541	1.575	1.767	1.827	1.697
43 Professional, Scientific & Technical Services	1.723	1.676	1.515	1.663	1.879
44 Administrative & Support Services	1.653	1.618	1.490	1.416	1.830
45 Health Care Services	1.643	1.572	1.401	1.506	1.850
46 Arts & Entertainment	2.119	2.125	1.937	1.912	2.071
47 Accommodation Services	1.692	1.720	1.612	1.466	1.780
48 Food & Beverage Services	1.916	1.886	1.607	1.437	1.803
49 Repair Maintenance Services	1.640	1.610	1.469	1.418	1.869
50 Grant-Making, Civic, Professional & Similar Org	1.562	1.516	1.359	1.294	1.828
51 Personal & Household Services	1.556	1.529	1.432	1.375	1.726

Note: Total Multipliers include the Direct and Indirect Industry impacts and the Induced impact of wage re-spending.

APPENDIX A:

Detailed Composition of

Medium Level Commodities

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
01 Grains	Wheat, unmilled, excl. imputed feed
	Wheat, unmilled, imputed feed
	Grain corn, excl. imputed feed
	Corn fodder, imputed feed
	Barley, excl. imputed feed
	Other grains, excl. imputed feed
	Other grains & fodder, imputed feed
02 Live Animals	Cattle & calves
	Hogs
	Poultry
	Other live animals
03 Other Agricultural Products	Fluid milk, unprocessed
	Eggs in the shell
	Honey & beeswax
	Fresh fruit, excl. tropical
	Potatoes, fresh or chilled
	Other vegetables, fresh or chilled
	Hay & straw, excl. imputed feed
	Hay & straw, imputed feed
	Seeds, excl. oil seeds
	Nursery stock, flowers, etc.
	Canola
	Soybeans & other oil seeds
	Raw tobacco
	Raw wool and mink skins
	Services incidental to crop production
	Services incidental to animal production
	Veterinary fees
	Tree pruning and surgery services
	Animal (pet) training, grooming and boarding services
	Services incidental to forestry
04 Forestry Products	Logs
	Poles, piling, bolts, etc.
	Pulpwood
	Fuelwood & other crude wood
	Custom forestry
05 Fishing & Hunting Products	Fish & seafood(except animal aquaculture), fresh,
	Animal aquaculture products, fresh, chilled
	Hunting & trapping products
06 Metal Ores & Concentrates	Iron ores & concentrates
	Gold & alloys in primary forms
	Radioactive ores & concentrates
	Bauxite ore
	Alumina (refined bauxite)
	Copper, nickel, lead and zinc ores & concentrates
	Other metal ores & concentrates

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
07 Coal	Coal
08 Natural Gas (excl liquified)	Crude mineral oils
	Natural gas, excl. liquefied
09 Non-Metallic Minerals	Sulphur, crude & refined
	Asbestos, crude & milled
	Gypsum
	Salt
	Peat
	Clays
	Natural abrasives & industrial diamonds
	Unsorted and non-industrial diamonds
	Other crude minerals
	Sand (excl. silica) & gravel
	Stone & silica sand for industrial use
	Stone for construction
10 Services Incidental to Mining	Services incidental to mining
11 Meat Products	Beef, fresh, chilled, frozen
	Pork, fresh, chilled, frozen
	Other meat, fresh, chilled, frozen
	Edible offal, fresh, chilled, frozen
	Cured meat
	Prepared meat products
	Animal fat & lard
	Margarine & shortening
	Sausage casings
	Feeds from animal byproducts
	Raw animal hides & skins
	Animal byproducts for ind. use
	Custom work, meat & food
	Poultry, fresh, chilled, frozen
12 Dairy Products	Fluid milk, processed
	Fresh cream
	Butter
	Cheese
	Evaporated & condensed dairy products
	Ice cream
	Powder dairy products
	Other dairy products
	Mayonnaise, salad dressing & mustard
13 Fish & Seafood Products	Fish & seafood prod. fresh, chilled, frozen
	Other fish & seafood products
14 Fruit & Vegetable Products	Frozen fruit & juice
	Other fruit juice
	Other fruit products
	Fruit & jam in airtight containers
	Frozen potatoes
	Other frozen vegetables

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
	Other preserved vegetables
	Vegetables & juice in airtight containers
	Soups in airtight containers
	Infant & junior foods, in airtight containers
	Sauces, pickles, etc.
	Vinegar
	Mineral water, fruit drinks & ice
	Pasta products, excl. dry pasta
	Prepared meals
15 Feeds	Feed supplements & premixes
	Complete feeds
	Feeds from grain byproducts
	Feeds from vegetable byproducts
	Pet feeds
	Oil-cake feeds
16 Wheat Flour & Starches	Wheat flour
	Starches
17 Other Cereal & Bakery Products	Breakfast cereal products
	Biscuits
	Bread & rolls
	Other bakery products
	Food snacks
18 Sugar	Sugar
19 Miscellaneous Food Products	Cocoa & chocolate
	Nuts
	Chocolate confectionery
	Other confectionery
	Crude vegetable oils
	Other flours & processed grains
	Maple sugar & syrup
	Other syrup
	Prepared cake & other mixes
	Dehydrated soup mixes & bases
	Roasted coffee
	Tea
	Potato chips & flakes
	Spices
	Peanut butter
	Food & drink powders
	Other food products
	Infant & junior foods, excl. in airtight container
	Dry pasta
20 Soft Drinks	Soft drink concentrates
	Carbonated soft drinks

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
21 Alcoholic Beverages	Distilled alc. beverages, bought in stores
	Distilled alc. beverages, consumed on lic. premise
	Beer, incl. coolers, bought in stores
	Beer, incl. coolers, consumed on lic. premises
	Wine, incl. coolers, bought in stores
	Wine. incl. coolers, consumed on lic. premises
22 Tires & Tubes	Passenger car tires
	Truck, bus & off-highway tires
	Other tires & tubes
	Tire repair material & retreaded tires
23 Other Rubber Products	Waterproof footwear
	Conveyor & transmission belting
	Self-adhesive tape (in rolls of a width not exceed
	Other rubber products for industrial use
	Hose & tubing, mainly rubber
24 Plastics Products	Plastic film & sheet (not laminated)
	Laminated plastic plates, sheets and shapes
	Foamed & expanded plastics
	Other plastic products, including cups
	Plastic building supplies
	Other rubber end products
	Plastic containers & closures
	Plastic pipe & pipe fittings
25 Leather & Leather Products	Leather & other leather goods
	Footwear, excl. waterproof
	Leather gloves
	Luggage, briefcases, etc.
	Handbags, wallets, etc.
26 Yarns & Fibres	Cotton yarn
	Man-made staple fibres
	Polyamide resins, including nylon
	Filament yarn
	Yarn of staple fibres
	Tire yarn
	Wool & wool mix yarn & thread
27 Fabrics	Cotton woven fabric
	Tire cord fabric
	Wool & wool mix woven fabric
	Man-made fabric for clothing
	Man-made fabric for industrial use
	Pile fabric
	Narrow fabrics, including lace
	Knitted fabrics
28 Clothing & Accessories	Hosiery
	Men's & boys' knitted clothing
	Sweaters
	Women's knitted clothing

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
	Children's knitted clothing
	Men's & boys' clothing
	Women's underwear & sleepwear
	Other women's clothing
	Children's wear
	Other clothing & accessories
	Dressed furs
	Fur apparel
29 Custom Tailoring	Custom tailoring
30 Other Textile Products	Bedding
	Felt
	Cotton thread
	Man-made thread
	Rope & twine
	Textile floor covering
	Textile dyeing & finishing service
	Awnings, tarpaulins, etc.
	Tents, sleeping bags, sails, etc.
	Other household textile products
	Textile medical products
	Other textile products
31 Lumber & Treated Wood	Lumber
	Treated wood
32 Other Wood Products	Plywood & veneer
	Wood chips
	Wood waste
	Custom wood work & millwork
	Wooden doors & windows
	Kitchen cabinets
	Other millwork
	Wood structural products
	Wood prefabricated buildings
	Wood containers & pallets
	Caskets & coffins
	Shingles & shakes
	Particle & wafer board
	Other wood end products
33 Furniture & Fixtures	Household furniture
	Furniture parts
	Office furniture
	Commercial & institutional furniture
	Mattresses & other furniture
	Portable lighting fixtures
34 Wood Pulp	Wood pulp

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
35 Newsprint & Other Paper	Newsprint paper
	Other paper, containing wood
	Other paper, woodfree
	Tissue & sanitary paper stock
	Wrapping & sack paper, bag stock
	Paperboard, including boxboard
	Building board & paper
	Asphalt building products
36 Coated Paper & Paper Products	Toilet paper, paper towel, tissue, etc.
	Paper waste & scrap
	Vinyl floor & wall covering
	Paper bags & sacks
	Paper boxes, cartons & drums
	Plastic bags
	Corrugated paper & board
	Wallpaper
	Other coated paper & products
	Aluminum foil
	Paper diapers & sanitary napkins
	Textile hygiene products
	Paper containers for commercial use
	Paper stationery
	Other stationery supplies
	Photographic paper
	Other paper end products
37 Printed Matter & Publishing Service	Newspapers
	Magazines & periodicals
	Books
	Greeting & post cards, maps, etc.
	Banknotes, cheques & stamps, etc.
	Printed business forms
	Advertising flyers, catalogues, directories
	Other printed matter
	Specialized publishing service
	Printing plates, type, etc, except for the trade
	Support activities for printing
38 Advertising in Print Media	Advertising in print media
39 Primary Iron & Steel Products	Ferro-alloys
	Iron & steel ingots, billets, etc.
	Steel castings
	Steel bars & rods, non-alloy, excl. reinforced
	Reinforcing bars & rods
	Alloy steel bars & rods
	Flat iron & steel, not alloy, not coated
	Flat iron & steel, alloy, coated
	Iron & steel railway construction material
	Oil & gas casing & drill pipe

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
	Oil & gas line pipe
	Other iron & steel pipes & tubes
	Other cast iron products
	Grinding balls & ingot moulds
	Cast iron pipe & fittings
	Other iron & steel pipe fittings
40 Aluminum & Aluminum Alloy Products	Aluminum & alloy ingots, billets, blocks & slabs
	Aluminum & alloys, other primary forms
	Aluminum & aluminum alloy fabricated materials (ex
41 Copper & Copper Alloy Products	Copper in primary forms
	Copper fabricated materials (except castings)
	Copper alloy fabricated materials (except castings
42 Nickel & Nickel Alloy Products	Nickel in primary forms
	Nickel & nickel alloy fabricated materials (except
43 Other Non-Ferrous Metal Products	Carbon & graphite products
	Lead in primary forms
	Zinc in primary forms
	Precious metals in primary forms excl. gold
	Other non-ferrous base metals
	Other non-ferrous base & fabricated materials
	Other inorganic bases & metallic oxides
	Metal scrap, excl. iron & steel
	Iron & steel scrap
	Lead & lead alloy fabricated materials
	Non-ferrous metal castings
	Soldering rods & wire
44 Boilers, Tanks & Plates	Fabricated steel plate
	Metal tanks
	Power boilers
45 Structural Metal Building Products	Iron & steel structural materials
	Prefabricated metal buildings
	Prefabricated metal structures
	Metal doors and windows
	Other metal building products
46 Other Metal Products	Corrugated metal culvert pipe
	Iron & steel stampings
	Metal roofing, siding, ducts, etc.
	Metal kitchen utensils
	Other kitchen utensils
	Other metal containers & closures
	Food, beverage and other cans
	Iron & steel wire & cable
	Iron & steel wire fencing & screen
	Chain, excl. motor vehicle & power transmission
	Welding rods & wire electrodes
	Wire products, including springs
	Fastener hardware

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
	Builders' hardware
	Other hardware
	Machine tools
	Tool accessories
	Hand & measuring tools
	Scissors, razor blades, industrial cutlery, etc.
	Non-electric furnaces & heating equipment
	Commercial cooking equipment
	Custom metal working (except coating, engraving, a
	Coated, engraved, heat treated or similarly treate
	Iron & steel forgings
	Valves
	Metal plumbing fixtures & fittings
	Plastic plumbing fixtures & fittings
	Gas & water meters
	Fire fighting & traffic control equipment
	Firearms & military hardware
47 Agricultural Machinery	Engines, parts, and assemblies for tractors
	Wheel tractors
	Crawler tractors
	Other agricultural machinery
48 Other Industrial Machinery	Bearings
	Mechanical power transmission equipment
	Pumps, compressors, fans & blowers
	Conveyors, elevators & hoisting machinery
	Industrial trucks & material handling equipment
	Fans & air circulation units, not industrial
	Packaging & bottling machinery
	Air purification equipment
	Other general purpose machinery
	Industrial furnaces, kilns & ovens
	Construction machinery
	Mining and oil and gas field machinery
	Logging, pulp & paper industry machinery
	Metal working machinery
	Other industry specific machinery
	Service industry machinery
	Power hand tools
	Air conditioning equipment, wall & window
	Air cond. & refrig. equip., commercial & transport
	Scales & balances
	Vending machines
	Computers, video units, printers, etc.
	Office equipment, excl. photocopy & facsimile
49 Motor Vehicles	Automobiles, excluding passenger vans
	Passenger vans
	Used motor vehicles (Business to persons)

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
	Trucks, road tractors & chassis
	Buses & chassis
	Off-highway trucks
	Military motor vehicles
	Motor homes, motorcycles & atvs
	Mobile homes
	Non-commercial trailers
50 Commercial Trailers & Semi-Trailers	Commercial trailers & semi-trailers
51 Motor Vehicle Parts	Truck & bus bodies & cargo containers
	Motor vehicle engines & parts
	Motor vehicle electric equipment
	Motor vehicle stampings
	Motor vehicle steering & suspension
	Motor vehicle wheels
	Motor vehicle brakes
	Motor vehicle plastic parts & trim
	Motor vehicle fabric accessories
	Motor vehicle transmission and power train parts
	Other motor vehicle parts and accessories
52 Other Transport Equipment & Repairs	Aircraft
	Aircraft engines
	Aircraft parts & equipment
	Aircraft service & repairs
	Locomotive, railway & urban trans. rolling stock
	Parts for loc., railway & urban trans. rolling sto
	Ships, boats & parts, excl. pleasure
	Ship repairs
	Snowmobiles
	Pleasure boats & sporting craft
53 Appliances & Household Equipment	Household clothes washers & dryers
	Household dishwashers
	Mowers, snowblowers, sprinklers, etc.
	Microwave ovens
	Sewing machines, vacuum cleaners and floor polishe
	Other small household appliances
	Electric furnace & other electric heating equipmen
	Household refrigerators & freezers
	Household cooking equipment, excl. microwave ovens
	Radio, stereo, cassette & CD players, & accessorie
	TV, VCR, and accessories
	Unrecorded tapes (blanks)

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
54 Other Electrical & Electronic Products	Telephone & related equipment, incl. facsimile
	Broadcasting & radio communications equipment
	Radar & radio navigation equipment
	Semi-conductors
	Printed circuits
	Integrated circuits
	Other electronic equipment components
	Electronic alarm & signal systems
	Welding machinery & equipment
	Power generation & marine prop., non-electric
	Electrical generators & motors
	Ballast
	Transformers & converters
	Industrial electric equipment, incl. safety
	Batteries
	Wire & cable, insulated, excl. aluminum
	Aluminum wire & cable
	Wiring materials & electrical meters
	Electric light bulbs & tubes
	Electric lighting fixtures, excl. portable
	Vehicle lighting equipment
55 Concrete & Concrete Products	Cement
	Concrete products
	Ready-mix concrete
56 Other Non-Metallic Mineral Products	Lime
	Bricks & other clay building products
	Porcelain insulators
	Ceramic household products
	Refractory products
	Natural stone products
	Gypsum building products
	Mineral wool building products
	Asbestos products
	Other non-metallic mineral basic products
	Glass and other glass products
	Safety glass
	Optical fibre cables
	Glass fibre batts, mats, etc.
	Glass containers
	Mirrors & glass household products
	Abrasive products
57 Gasoline & Fuel Oil	Motor gasoline
	Aviation fuel
	Diesel oil
	Light fuel oil
	Heavy fuel oil

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
58 Other Petroleum & Coal Products	Lubricating oils & greases
	Benzene, toluene & xylene
	Liquid petroleum gases, incl. natural gas
	Naphtha
	Asphalt compound, hot bulk
	Other asphalt products
	Petrochemical feed stock
	Tar & pitch
	Coke
59 Industrial Chemicals	Ethylene polymers
	Other polymers
	Cellulosic plastic film & sheet
	Monoethylene glycol
	Chlorine
	Oxygen
	Phosphorous
	Other chemical elements
	Sulphuric acid
	Other inorganic acids & oxygen compounds
	Ammonia
	Caustic soda
	Sodium chlorate
	Sodium phosphates
	Sodium carbonate
	Other metallic salts & peroxysalts
	Deuterium oxide (heavy water)
	Radioactive chemicals
	Other inorganic chemicals
	Ethylene
	Butylenes
	Butadiene
	Styrene
	Vinyl chloride
	Other hydrocarbons & derivatives
	Methyl alcohol
	Other alcohols & derivatives
	Ethers, alcohol peroxides, etc.
	Other phenols, aldehydes & ketones
	Organic acids & derivatives
	Organo-inorganic compounds
	Other organic chemicals
	Titanium dioxide, excl. slag
	Carbon
	Pigments, lakes & dyes
	Synthetic rubber
	Rubber & plastic compounding agents
	Crude vegetable materials & extracts

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
60 Fertilizers	Animal & vegetable fertilizers, imputed
	Animal & vegetable fertilizers, excl. imputed
	Potash
	Chemical fertilizers
61 Pharmaceuticals	Pharmaceuticals
62 Other Chemical Products	Nitrogen function compounds
	Paints & related products
	Refined vegetable oils
	Oral care products
	Soaps
	Detergents
	Other cleaning products
	Other industrial chemical preparations
	Cosmetic products
	Hair care products
	Other personal care products
	Bleach and fabric softeners
	Antifreezing preparations
	Additives & automobile chemicals
	Explosives & non-military ammunition
	Military ammunition & ordnance
	Insecticides & herbicides
	Adhesives
	Catalysts
	Metal working industrial chemicals
	Printing & other inks
	Polish, cream & wax products
	Other oils, fats & waxes
	Vinyl polymers
63 Lab., Medical & Photo. Equipment	Aircraft & nautical navig. instruments, excl. radi
	Lab & scientific instruments, & flight simulators
	Measuring & controlling instruments
	Medical & dental equipment & supplies
	Opthalmic goods
	Personal medical goods
	Industrial safety equipment
	Watches, clocks, etc.
	Optical & photo equipment
	Photocopy & microfilm equipment
	Photographic film & plate
64 Other Manufactured Products	Jewelry, silverware, flatware, etc.
	Brooms, brushes, mops, etc.
	Bicycles
	Recreational equipment
	Toys & games, incl. electronic
	Impregnated & coated fabrics
	Floor & wall covering, backed with paper

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
	Advertising signs, displays, etc.
	Shades & blinds
	Custom work, refined petroleum and coal
	Other custom work
	Animal hair, fur dyeing, etc.
	Other metal end products
	Sewing needs
	Recorded media (including music and movies)
	Musical instruments and artisits' supplies
	Smokers' supplies
	Art & decorative goods, misc. end products
65 Construction	Residential construction
	Non-residential building construction
	Road, highway & airport runway construction
	Gas & oil facility construction
	Electric power, dams & irrigation construction
	Railway & telecommunications construction
	Other engineering construction
	Repair construction
66 Pipeline Transportation	Pipeline transportation of natural gas
	Crude oil and other pipeline transportation
67 Air Transportation	Air transport, passenger
	Air transport, freight
	Air transport, specialty
	Services incidental to air transport
68 Water Transportation	Water transport, passenger
	Water transport, freight
	Water transport, other
	Services incidental to water transport
69 Rail Transportation	Rail transport, passenger
	Rail transport, freight
	Services incidental to rail transport
70 Truck Transportation	Truck transportation
71 Other Transportation Services	Scenic and sightseeing transportation, bus
	School bus & other transportation
	Ambulance services
	Travel agents, tour wholesaler & operator services
	Parking services
	Other services incidental to transport
	Bus transport, interurban & rural, passenger
	Bus transport, interurban & rural, parcel express
	Urban transit
	Taxicab transportation
	Highway and bridge maintenance
72 Storage & Warehousing	Grain storage
	Other storage and warehousing

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
73 Radio & Television Broadcasting	Radio & television broadcasting, except cable
	Cable and other subscription programming
74 Telephone & Telecommunication Services	Telephone & other telecommunications
75 Postal Services	Postal services
76 Electric Power	Electric power
77 Other Utilities	Gas distribution
	Water supply
	Other utilities
78 Wholesale & Retail Margins	Wholesaling margins
	Retailing margins
	Retailing service
79 Financial Institution Fees	Gross imputed rent
	Central bank
	Implicit charges, deposits, banking & oth. dep. cr
	Implicit charges, loans, banking & oth. dep. cred.
	Paid charges, banks & oth. dep. acc. intermed.
	Implicit charges, deposits, local credit unions
	Implicit charges, loans, local credit unions
	Paid charges, credit unions & caisses pop.
80 Investment & Management Fees	Royalties & licence fees (excl. natural resource)
	Commissions, investment banking and securities dea
	Implicit charge, non-depository credit intermediat
	Mutual funds
	Other securities, funds, and related services
	Other non-depository credit interm. services
	Management fees of companies and enterprises
	Real estate commissions & management fees
81 Insurance Services	Life insurance
	Non-life insurance
	Trusteed pension funds
	Insurance commissions
82 Rent	Gross paid residential rent
	Imputed lodging
	Lodging in universities
	Other paid lodging, excl. universities
	Non-residential rent
83 Professional Business Services	Architect, engineering, & scientific services
	Accounting & legal services
	Advertising services
	Other professional, scientific and technical servi
84 Computer Services	Software products development
	Own-account software
	Computer lease & rental (hardware)
	Data processing services
	Computer systems design and related services
	On-line information services

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
85 Other Services to Business	Other information services (including news synd.,
	Investigation and security services
	Other administrative and support services
	Other personal services
	Courier service
86 Education Services	University fees
	Elementary and secondary school fees
	College and C.E.G.E.P. fees
	Other education fees
87 Health & Social Services	Hospital services
	Residential care facilities
	Child care, outside the home
	Other health & social services
	Laboratory services
	Physician services
	Dental service
	Other health practitioner services
88 Accommodation & Food Services	Hotel and motel accommodation services
	Other accommodation services
	Meals (outside home)
	Board paid
89 Amusement & Recreation Services	Motion picture, audio, & video prod. & distributio
	Motion picture exhibition
	Lottery and other gambling
	Race track services
	Other amusement and recreation services
90 Other Personal & Business Services	Automotive repair and maintenance service
	Other repair and maintenance
	Rental of office equipment
	Laundry and dry cleaning
	Barber & beauty services
	Funeral services
	Child care, in the home
	Private household service
	Other personal care services
	Photographic services
	Services to buildings & dwellings
	Rental of automobiles & trucks
	Trade unions dues
	Political parties
	Other membership organization dues
	Rental, video & recreation equipment
	Rental, other machinery & equipment incl. const
91 Transportation Margins	Transportation margins

Composition of Medium Level Commodities

Medium Level Commodities	Commodities Included
92 Miscellaneous Operating Supplies	Spare parts & maintenance supplies
	Office supplies
	Cafeteria supplies
	Laboratory equipment & supplies
93 Misc. Travel, Entertainment & Promotion	Travelling and entertainment
	Advertising & promotion
94 Non-Competing Imports	Raw cotton
	Natural rubber & gums
	Raw sugar
	Cocoa beans
	Coffee, not roasted
	Tropical fruit
	Unallocated imports & exports
Direct Wages & Salaries	Wages and salaries
	Supplementary labour income
	Mixed income

APPENDIX B:

Detailed Composition of

Medium Level Industries

Composition of Medium Level Industries

Medium Level Industries	Industries Included
1 Agriculture, Crop Production	Greenhouse, Nursery and Floriculture Production
	Crop Production (except Greenhouse, Nursery, etc.)
	Support Activities for Crop Production
2 Agriculture, Livestock Production	Animal Aquaculture
	Animal Production (except Animal Aquaculture)
	Support Activities for Animal Production
3 Mining & Mineral Extraction Industries	Oil and Gas extraction
	Coal Mining
	Iron Ore Mining
	Gold and Silver Ore Mining
	Copper, Nickel, Lead and Zinc Ore Mining
	Other Metal Ore Mining
	Stone Mining and Quarrying
	Sand/Gravel/Clay/Ceramic&Refractory Minerals Mining/Quarrying
	Salt Mining
	Asbestos Mining
	Potash Mining
	Misc Non-Metallic Mineral Mining and Quarrying
	Diamond Mining
	Support Activities for Mining & Oil/Gas Extraction
4 Other Primary Industries	Forestry and Logging
	Fishing, Hunting and Trapping
	Support Activities for Forestry
5 Electric Power Generation & Distribution	Electric Power Generation, Transmission and Distribution
6 Natural Gas Distribution	Natural Gas Distribution
7 Water, Sewage & Other Systems	Water, Sewage and Other Systems
8 Construction	Residential Building Construction
	Non-residential Building Construction
	Transportation Engineering Construction
	Oil and Gas Engineering Construction
	Electric Power Engineering Construction
	Communication Engineering Construction
	Other Engineering Construction
	Repair Construction
	Other Activities of the Construction Industry
9 Food & Beverage Manufacturing	Animal Food Manufacturing
	Flour Milling and Malt Manufacturing
	Starch and Vegetable Fat and Oil Manufacturing
	Breakfast Cereal Manufacturing
	Sugar Manufacturing
	Confectionery Product Manufacturing
	Frozen Food Manufacturing
	Fruit and Vegetable Canning, Pickling and Drying
	Dairy Product Manufacturing
	Animal (except Poultry) Slaughtering
	Rendering and Meat Processing from Carcasses

Composition of Medium Level Industries

Medium Level Industries	Industries Included
	Poultry Processing
	Seafood Product Preparation and Packaging
	Bread and Bakery Product Manufacturing
	Cookie and Cracker Manufacturing
	Flour Mixes & Dough Mfg from Purchased Flour
	Dry Pasta and Tortilla Manufacturing
	Snack Food Manufacturing
	Coffee and Tea Manufacturing
	Other Miscellaneous Food Manufacturing
	Soft Drink and Ice Manufacturing
10 Alcoholic Beverage & Tobacco Manufacturing	Breweries
	Wineries
	Distilleries
	Tobacco Manufacturing
11 Textiles & Textile Product Manufacturing	Fibre, Yarn and Thread Mills
	Fabric Mills
	Textile and Fabric Finishing and Fabric Coating
	Carpet and Rug Mills
	Curtain and Linen Mills
	Textile Bag and Canvas Mills
	All Other Textile Product Mills
12 Clothing Manufacturing	Hosiery and Sock Mills
	Other Clothing Knitting Mills
	Cut and Sew Clothing Contracting
	Men's and Boys' Cut and Sew Clothing Mfg
	Women's and Girls' Cut and Sew Clothing Mfg
	Other Cut and Sew Clothing Manufacturing
	Clothing Accessories and Other Clothing Mfg
13 Leather & Leather Product Manufacturing	Leather and Hide Tanning and Finishing
	Footwear Manufacturing
	Other Leather and Allied Product Manufacturing
14 Wood Product Manufacturing	Sawmills and Wood Preservation
	Structural Wood Product Manufacturing
	Veneer and Plywood Mills
	Particle Board, Fibreboard, and Waferboard Mills
	Wood Window and Door Manufacturing
	Other Millwork
	Wood Container and Pallet Manufacturing
	All Other Wood Product Manufacturing
15 Paper Manufacturing	Pulp Mills
	Paper (except Newsprint) Mills
	Newsprint Mills
	Paperboard Mills
	Paperboard Container Manufacturing
	Paper Bag and Coated and Treated Paper Manufacturing
	Stationery Product Manufacturing
	Other Converted Paper Product Manufacturing

Composition of Medium Level Industries

Medium Level Industries	Industries Included
16 Printing & Related Support Activities	Printing
	Support Activities for Printing
17 Petroleum & Coal Product Manufacturing	Petroleum Refineries
	Asphalt Paving, Roofing and Saturated Materials Mfg
	Other Petroleum and Coal Products Manufacturing
	Petrochemical Manufacturing
18 Chemical Manufacturing	Industrial Gas Manufacturing
	Synthetic Dye and Pigment Manufacturing
	Other Basic Chemical Manufacturing
	Resin/Synthetic Rubber/Artificial&Synthetic Fibres/Filamement Mfg
	Fertilizer Manufacturing
	Pesticide and Other Agricultural Chemical Mfg
	Pharmaceutical and Medicine Manufacturing
	Paint and Coating Manufacturing
	Adhesive Manufacturing
	Soap and Cleaning Compound Manufacturing
	Toilet Preparation Manufacturing
	Other Chemical Product Manufacturing
19 Plastic & Rubber Product Manufacturing	Unsupported Plastic Film, Sheet and Bag Mfg
	Plastic Pipe, Pipe Fitting, Unsupported Profile Mfg
	Laminated Plastic Plate, Sheet and Shape Mfg
	Plastic Bottle Manufacturing
	Polystyrene, Urethane and Other Foam Product Mfg
	Motor Vehicle Plastic Parts Manufacturing
	Miscellaneous Plastic Product Manufacturing
	Tire Manufacturing
	Rubber and Plastic Hose and Belting Manufacturing
	Other Rubber Product Manufacturing
20 Non-Metallic Mineral Product Manufacturing	Clay Product and Refractory Manufacturing
	Glass and Glass Product Manufacturing
	Cement Manufacturing
	Ready-Mix Concrete Manufacturing
	Concrete Product Manufacturing
	Lime and Gypsum Product Manufacturing
	Other Non-Metallic Mineral Product Manufacturing
21 Iron & Steel Mills & Primary Shapes	Iron and Steel Mills & Ferro-Alloy Manufacturing
	Iron & Steel Pipes/Tubes from Purchased Steel
	Rolling and Drawing of Purchased Steel
22 Non-Ferrous Smelting & Primary Production	Primary Production of Alumina and Aluminum
	Aluminum Rolling, Drawing, Extruding and Alloying
	Other Non-Ferrous Metal Smelting/Refining
	Other Non-Ferrous Metal Rolling, Drawing, Extruding and Alloying
23 Fabricated Metal Product Manufacturing	Ferrous Metal Foundries
	Non-Ferrous Metal Foundries
	Forging and Stamping
	Cutlery and Hand Tool Manufacturing
	Prefabricated Metal Building and Component Mfg

Composition of Medium Level Industries

Medium Level Industries	Industries Included
	All Other Plate Work and Fabr Struct Prod Mfg
	Ornamental and Architectural Metal Products Mfg
	Power Boiler and Heat Exchanger Manufacturing
	Metal Tank (Heavy Gauge) Manufacturing
	Other Metal Container (Light Gauge) Manufacturing
	Hardware Manufacturing
	Spring and Wire Product Manufacturing
	Machine Shops
	Turned Product and Screw, Nut and Bolt Mfg
	Coating, Engraving, Heat Treating & Allied Activities
	Other Fabricated Metal Product Manufacturing
24 Agricultural Implement Manufact.	Agricultural Implement Manufacturing
25 Other Machinery Manufacturing	Construction Machinery Manufacturing
	Mining and Oil and Gas Field Machinery Mfg
	Industrial Machinery Manufacturing
	Commercial and Service Industry Machinery Mfg
	Ventilation/Heating/Air-Conditioning/Comm.Refrigeration Equip Mfg
	Metalworking Machinery Manufacturing
	Engine, Turbine and Power Transmission Equip Mfg
	Pump and Compressor Manufacturing
	Material Handling Equipment Manufacturing
	All Other General-Purpose Machinery Manufacturing
26 Computer & Electronics Manufacturing	Computer and Peripheral Equipment Manufacturing
	Telephone Apparatus Manufacturing
	Dadio/TV Broadcasting & Wireless Communications Equip Mfg
	Other Communications Equipment Manufacturing
	Audio and Video Equipment Manufacturing
	Semiconductor and Other Electronic Component Mfg
	Navigational, Measuring, Medical & Control Instruments Mfg
	Manufacturing/Reproducing Magnetic/Optical Media
27 Electrical Equipment & Component Manufacturing	Electric Lighting Equipment Manufacturing
	Household Appliance Manufacturing
	Power, Distribution & Specialty Transformers Mfg
	Motor and Generator Manufacturing
	Switchgear/Switchboard/Relay & Industrial Control Apparatus Mfg
	Battery Manufacturing
	Communication and Energy Wire and Cable Mfg
	Wiring Devices, All Other Electrical Equipment & Component Mfg
28 Transportation Equipment Manufacturing	Automobile and Light-Duty Motor Vehicle Mfg
	Heavy-Duty Truck Manufacturing
	Motor Vehicle Body and Trailer Manufacturing
	Motor Vehicle Gasoline Engine & Parts Mfg
	Motor Vehicle Electrical & Electronic Equipment Mfg
	Motor Vehicle Steering & Suspension Components Manufacturing
	Motor Vehicle Brake System Manufacturing
	Motor Vehicle Transmission & Power Train Parts Mfg
	Motor Vehicle Seating and Interior Trim Mfg

Composition of Medium Level Industries

Medium Level Industries	Industries Included
	Motor Vehicle Metal Stamping
	Other Motor Vehicle Parts Manufacturing
	Aerospace Product and Parts Manufacturing
	Railroad Rolling Stock Manufacturing
	Ship Building and Repairing
	Boat Building
	Other Transportation Equipment Manufacturing
29 Furniture Manufacturing	Wood Kitchen Cabinet and Counter Top Mfg
	Institutional Furniture Manufacturing
	Household Furniture Manufacturing
	Office Furniture (including Fixtures) Manufacturing
	Other Furniture-Related Product Manufacturing
30 Miscellaneous Manufacturing	Medical Equipment and Supplies Manufacturing
	Jewellery and Silverware Manufacturing
	Sporting and Athletic Goods Manufacturing
	Doll, Toy and Game Manufacturing
	Office Supplies (except Paper) Manufacturing
	Sign Manufacturing
	All Other Miscellaneous Manufacturing
31 Wholesale Trade	Wholesale Trade
32 Retail Trade	Retail Trade
33 Truck Transportation	Truck Transportation
34 Transit & Ground Passenger Transportation	Urban Transit Systems
	Interurban and Rural Bus Transportation
	Taxi and Limousine Service
	All Other Transit & Ground Passenger Transportation
35 Pipeline Transportation	Pipeline Transportation of Natural Gas
	Crude Oil and Other Pipeline Transportation
36 Air, Rail & Water Transportation & Support	Air Transportation
	Rail Transportation
	Water Transportation
	Scenic and Sightseeing Transportation
	Support Activities for Transportation
37 Postal & Messenger Services	Postal Service
	Couriers and Messengers
38 Warehousing & Storage	Farm Product Warehousing and Storage
	All Other Warehousing and Storage
39 Motion Picture & Sound Recording Industries	Motion Picture and Video Exhibition
	Motion Picture & Video Production, Distribution & Post-Production
	Sound Recording Industries
40 Broadcasting & Telecommunications	Radio and Television Broadcasting
	Pay TV, Specialty TV and Program Distribution
	Telecommunications
41 Information & Data Services, Including Publishing	Newspaper, Periodical, Book and Database Publishers
	Software Publishers
	Information Services
	Data Processing Services

Composition of Medium Level Industries

Medium Level Industries	Industries Included
42 Finance, Insurance & Real Estate Services	Monetary Authorities - Central Bank
	Local Credit Unions
	Banking and Other Depository Credit Intermediation
	Insurance Carriers
	Lessors of Real Estate
	Owner-Occupied Dwellings
	Automotive Equipment Rental and Leasing
	Rental and leasing (except Automotive Equipment)
	Non-Depository Credit Intermediation & Related
	Agencies, Brokerages and Other Insurance Related
	Securities, Commodity Contracts, Funds, Other Financial Investment
	Offices of Real Estate Agents and Brokers & Related Activities
	Management of Companies and Enterprises
43 Professional, Scientific & Technical Services	Architectural, Engineering and Related Services
	Computer Systems Design and Related Services
	Advertising and Related Services
	Legal/Accounting/Tax Preparation/Bookkeeping & Payroll Services
	Other Professional, Scientific and Technical Services
	Education and Educational Support Services (excluding non-profit and government)
44 Administrative & Support Services	Travel Arrangement and Reservation Services
	Investigation and Security Services
	Services to Buildings and Dwellings
	Other Administrative and Support Services
	Waste Management and Remediation Services
45 Health Care Services	Offices of Physicians
	Offices of Dentists
	Miscellaneous Ambulatory Health Care Services
	Nursing and Residential Care Facilities
	Social Assistance
46 Arts & Entertainment	Performing Arts, Spectator Sports and Related Ind
	Heritage Institutions (excluding Government Funded)
	Gambling Industries
	Amusement and Recreation Industries
47 Accommodation Services	Traveller Accommodation
	RV Parks, Recreational Camps, Room & Boarding
48 Food & Beverage Services	Food Services and Drinking Places
49 Repair Maintenance Services	Automotive Repair and Maintenance
	Repair & Maintenance (except Automotive)
50 Grant-Making, Civic, Professional & Similar Organizations	Grant-Making, Civic, Professional & Similar Organizations
51 Personal & Household Services	Funeral Services
	Dry Cleaning and Laundry Services
	Personal Care Services and Other Personal Services
	Private Households

APPENDIX C:

Commodity Spending Impact on the Provincial Economy

Manitoba Medium Commodity Supply Table

MBS Input – Output Analysis

Commodity Spending Impact on the Provincial Economy

Manitoba Bureau of Statistics

RIGHT ANSWERS *RIGHT NOW*

Monitoring Trends
September 2004

MANITOBA BUREAU OF STATISTICS

MONITORING TRENDS SEPTEMBER 2004

COMMODITY SOURCE TABLE

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COMMODITY SOURCE TABLE

Commodity source tables are extremely useful in understanding the magnitude of change and the level of spin-offs in the economy from a given impact analysis. Source tables provide a quantitative measure of the impact on the economy (multiplier) from either an increase or decrease in spending on commodities. In addition, the tables show the supply source for all the commodities used within the economy. It provides the Manitoba and the Non-Manitoba share of all the goods and services consumed in the province. For example, if a commodity is exclusively produced in the province, the source table shares for direct Manitoba supply content will be 1.00 or 100%. If on the other hand, the item is exclusively imported into the province the share for Non-Manitoba content (leakage) will be 1.00 or 100%. Depending on the commodity, the supply source share will vary in-between 0% to 100%. The sum of the commodity source table shares (Manitoba content and Non-Manitoba content) always add up to 1.00 or 100%.

The Manitoba Bureau of Statistics' (MBS) forthcoming **Manitoba Economic Multipliers 2004** publication provides an additional breakdown of the direct Manitoba supply content, into direct production costs and margins (service markups and taxes). These two data series provide the share of the product cost and the markup and indirect taxes of only locally supplied items.

If a commodity has a high direct Manitoba supply content, its increased demand will stimulate local production and thereby generate greater spin-off activities in the economy. Conversely, if a commodity has a high indirect leakage from the Manitoba economy (imported item), the economic impact from an increase in demand for this commodity will be marginal.

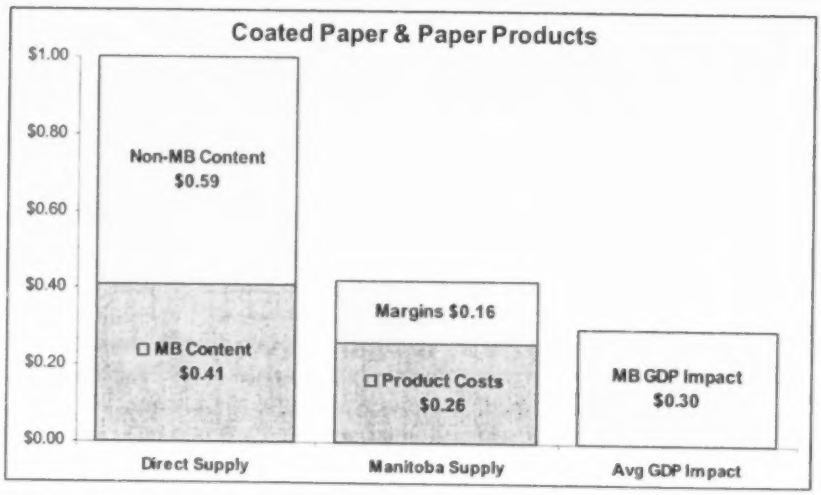
MBS maintains a commodity supply source data series for 727 commodities. For presentation and publication reasons the 727 commodities are aggregated into 94 categories. The tables are developed from the annual Input-Output and Final Demand tables published by statistics. The latest source table is derived from the 1999 Input-output tables. Input-output tables essentially show a snap shot, for a given year, of where all the commodities are consumed or used within Manitoba. It shows whether a good or service is used by an industry as an intermediate item for generating other commodities or by households, business, governments and exports as final demand. For the supply side, the input-output tables also provide a snap shot, for a given year, of where the commodities are coming from, either from local industries or as imports.

The objective of this document is to highlight how spending on different commodities has varying economic impact on Manitoba. The document provides five examples, showing how a dollar spent on a commodity is distributed and what level of impact it has on the economy in general.

EXAMPLES OF WHAT HAPPENS TO $1.00 SPENT ON A COMMODITY SPENT IN MANITOBA

Example 1: Coated Paper and Paper Products

For every dollar spent in Manitoba on the commodity category coated paper & paper products, $0.59 is supplied from outside (leaked) the province while $0.41 is supplied locally.



Since Manitoba produces several commodities within the coated paper and paper products category, $0.26 of the $0.41 local supply is attributed toward the product itself while $0.16 is attributed to markup margins and taxes (value added). The margins include wholesale margin, retail margin and transportation margin and indirect taxes.

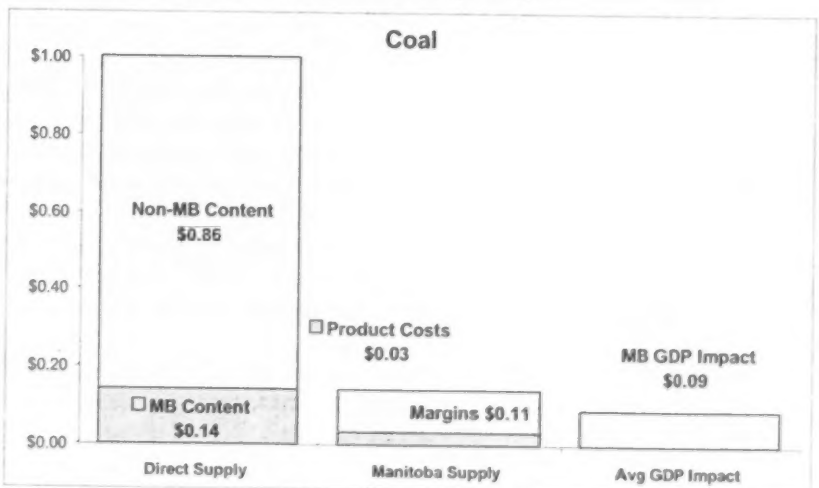
The positive average economic impact, including business and consumer spin-offs, from a $1.00 purchase of paper products is $0.30. **Therefore, the average economic multiplier for paper products is 0.3, indicating that for every $1.00 spent on this product; the Manitoba economy is stimulated by $0.30.**

The average GDP impact multiplier less than 1.00 is partially due to the fact that a significant portion of the supply for this good is from outside Manitoba. Some of the spending on paper product is shipped out of the province, thereby limiting the multiplier principle.

Example 2: Coal

For every dollar spent in Manitoba on the fossil fuel coal, $0.86 is supplied from outside (leaked) the province while $0.14 is supplied locally.

Of the local supply only $0.03 is attributed toward the product itself while $0.11 is attributed to markup margins and taxes



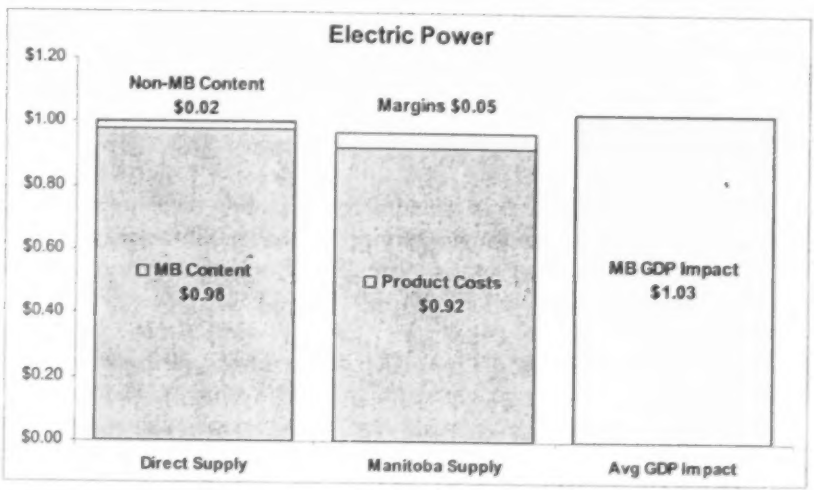
(value added). The margins attributed to purchases of coal are mainly in the form of transportation and wholesale margins.

The positive average economic impact, including business and consumer spin-offs, from a $1.00 purchase of coal is $0.09. **Therefore, the average economic multiplier for coal is 0.09, indicating that for every $1.00 spent on this product, the Manitoba economy is stimulated by $0.09.**

The average GDP impact multiplier less than 1.00 is partially due to the fact that 86% of coal is supplied from outside Manitoba. Most of the new expenditures on coal are shipped out of the province, thereby significantly limiting the multiplier principle.

Example 3: Electric Power

For every dollar spent in Manitoba on electric power, $0.02 is supplied from outside (leaked) the province while $0.98 is supplied locally (mainly Manitoba Hydro).



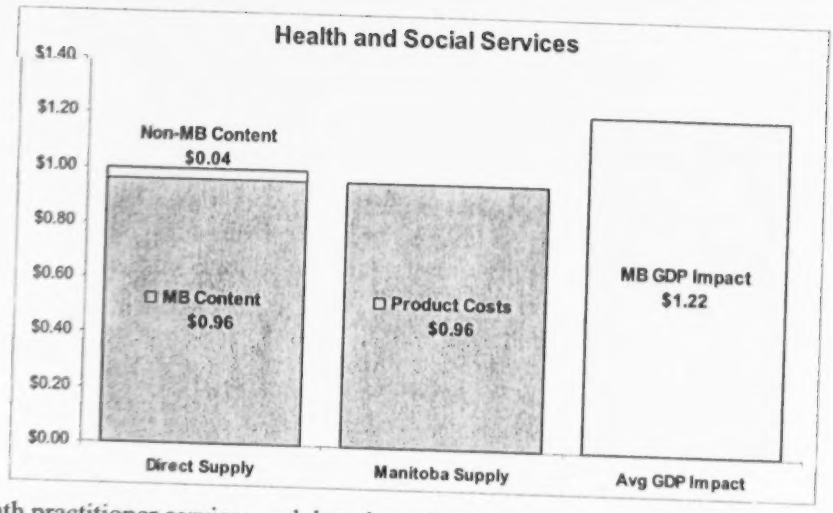
Since Manitoba produces almost all its electric power, $0.92 of the $0.98 local supply is attributed toward the product itself while $0.05 is attributed to markup margins and taxes (value added). The margins generated by electric power are essentially indirect taxes.

The positive average economic impact, including business and consumer spin-offs, from a $1.00 purchase of electricity is $1.03. **Therefore, the average economic multiplier for electric power is 1.03, indicating that for every $1.00 spent on this product, the Manitoba economy is stimulated by $1.03.**

The average GDP impact multiplier greater than 1.00 is partially due to the fact that most of the electricity power is supplied from within Manitoba. Most of the new expenditures on electricity power are retained in the province, thereby enhancing the multiplier principle.

Example 4: Health & Social Services

For every dollar spent in Manitoba on health and social services, $0.04 is supplied from outside (leaked) the province while $0.96 is supplied locally.



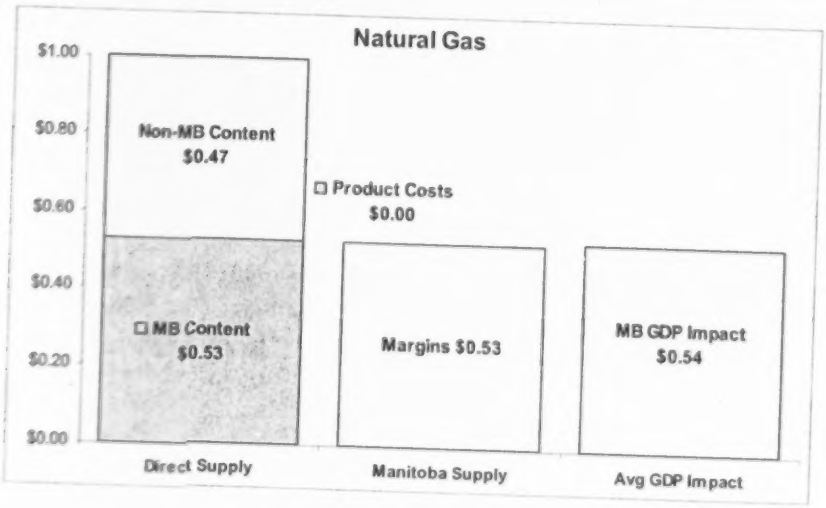
Of the local supply, all $0.92 is attributed toward the product itself while nothing ($0.0) is attributed to markup margins and taxes (value added). The products in health and social services include physician services, other heath practitioner services and dental services.

The positive average economic impact, including business and consumer spin-offs, from a $1.00 purchase of health and social services is $1.22. **Therefore, the average economic multiplier for health and social services is 1.22, indicating that for every $1.00 spent on this product, the Manitoba economy is stimulated by $1.22.**

The average GDP impact multiplier greater than 1.00 is partially due to the fact that almost all health and social services are supplied from within Manitoba. Most of the new expenditures on health and social services are related to wages and salaries and are, therefore, retained in the province. Since the household sector has a relatively high propensity to consume, the increase is wages and salaries generally translate into a strong multiplier effect.

Example 5: Natural Gas

For every dollar spent in Manitoba on natural gas, $0.47 is supplied from outside (leaked) the province while $0.53 is supplied locally. In other words, over 50% of expenditures on natural gas remain in Manitoba. This is somewhat surprising since all natural gas used in the province is imported (from Alberta).



Focusing on the Manitoba Supply, the chart shows that all $0.53 from the Manitoba content of the natural gas commodity is attributed to margins and nothing is attributed to the product ($0.00). This implies that Manitoba does not produce natural gas and that it earns a significant portion from distribution ($0.29), transportation ($0.15) and taxation ($0.08) of natural gas.

Despite the fact that Manitoba imports all its natural gas needs, the positive average GDP economic impact, including business and consumer spin-offs, from a $1.00 purchase of natural gas is $0.54. **Therefore, the average economic multiplier for natural gas is 0.54, indicating that for every $1.00 spent on this product; the Manitoba economy is stimulated by $0.54.**

Conclusion:

As illustrated by these examples, the size and type of economic impact from an increase in spending on goods and services will depend to a large extent on the type of items being purchased. If the items being purchased are imported into the province, the impact will be relatively small with little trickle down effect. If on the other hand, the items being purchased are locally produced, the economic impact will be relatively large with a sizable business and consumer spin-off. In addition, if the locally produced items have a relatively high labour content, the impact tends to be somewhat larger, since wages and salaries are re-spend in the economy.

Health and social services, education, other utilities and electric power all have relatively high direct Manitoba supply content, and correspondingly a high average GDP impact. Health and social services and education, which has a high labour content, has a stronger multiplier impact compared with the other utilities and electric power products, which are more capital intensive.

All metallic alloy product (aluminum, copper and nickel) motor vehicles, coal and rubber products have a high import content and thereby a low average GDP impact.

The natural gas example illustrates an important point on source tables and multiplier analysis. It indicates that for certain commodities that are exclusively imported into the province (leakages), local business and governments may still benefit from earning in the form of margins (wholesale margins, retail margins, transportation margins and indirect taxes).

The commodity source tables in the MBS **Manitoba Economic Multipliers 2004** publication contains the source decomposition of commodity purchases for 94 commodity groups in the following four categories:

1. Indirect Leakage from Manitoba Economy
2. Direct Manitoba Supply Content
3. Direct Industry Output (Product Value)
4. Service Markups & Taxes (Marginal Value)

Manitoba